

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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Published every Thursday Morning by DAVID WILLIAMS, Nos. 66 and 68 Duane Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XL: No. 1.

New York, Thursday, July 7, 1887.

\$4.50 a Year, Including Postage.
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The Hege Improved Saw-Mill.

The Salem Iron Works, of Salem, N. C., are building an improved form of saw-mill, in which an entirely new device has been adopted for operating the set works. The engravings which we give below, together with the details on page 9, will explain the general design. Instead of using two or more head-blocks, with uprights acting independently or simultaneously, as with screw-head blocks and some lever sets, a sufficient

racks on the other side of the groove are connected together in the same way. A pinion, A, for each set of racks, which is shown in the cut, is of proper size to gear into the racks on both sides of the groove at the same time, and extends far enough below to also gear firmly into the rack on the side of the head-block underneath. In one of these pinions is secured one end of a shaft, which extends upward through the log-beam to the top of a dial-plate (see Fig. 4, on page 9), where the end is se-

holes for stop pins so that the ratchet-wheel may be moved any distance desired, from $\frac{1}{4}$ to $\frac{1}{2}$ around, by one stroke of the lever, which will move the log-beam from $\frac{1}{4}$ inch to 2 inches. When the stops are set for any particular thickness of lumber, and the lever is moved the full distance between the stops, it will always move the log-beam the same distance. The lever by which the ratchet-wheel is turned is easily moved by the sawyer, even when there is a heavy log on the carriage. Fig. 3 is a front view of

chains, composed of what we should call eye-bars, each link containing six eye-bars, so that each pin connection passed through 12 eyes. This must have been originally an excellent arrangement, such chains being flexible enough for their purpose, and not liable to some of the obscure defects of ropes, while they would be much more easily inspected than wire cables. In fact, inspection of a certain sort seems to have been regularly given them, and two years ago the municipal officers, who were naturally anxious

precision, and the condition of the bridge as shown after the accident was quite bad enough to account for the catastrophe independent of vibrations. Instead of the "good condition" in which the "experts" reported that they had found the ironwork, eleven out of the twelve eye-bars composing the broken double chain were found to have lost five-sixths of their substance by rust; the metallic section of each eye-bar remaining being, on an average, one-tenth of an inch thick; while the twelfth member, off the

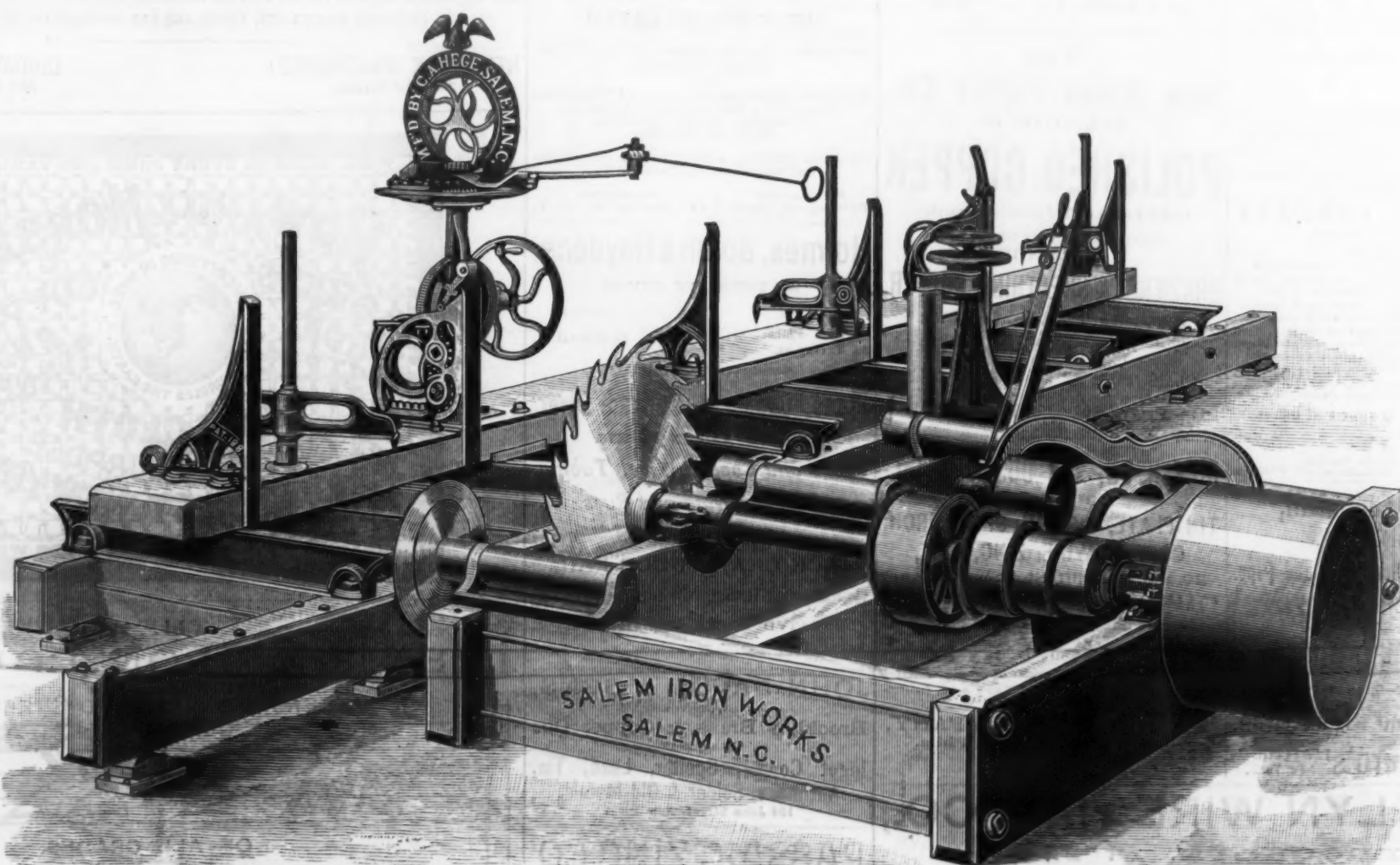


Fig. 1.—General View.

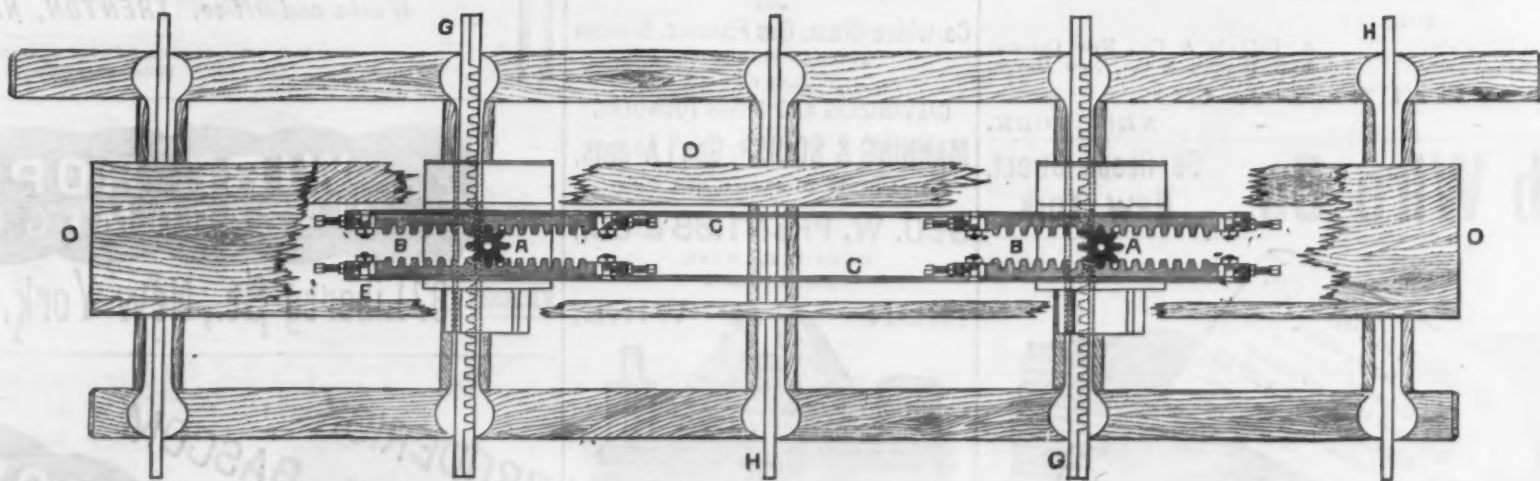


Fig. 2.—Sectional Plan of Set Works.

(For Figs. 3 and 4 see page 9.)

IMPROVED 25-FOOT SAW-MILL, BUILT BY THE SALEM IRON WORKS, SALEM, N. C.

number of head-blocks are provided, and placed across the carriage at intervals of 4 or 5 feet throughout its entire length. Upon these is a long bar or slide of wood, to which are rigidly fastened the cast iron uprights or knees for the log to rest against. Two or more of the head-blocks, at suitable distances from each other, are provided with racks extending their entire length on one side, as shown in Fig. 2. In the underside of the wooden slide or log-beam is a groove running its entire length. In this groove are arranged racks B B on each side, and so placed that when the log beam O is about the middle of the carriage the center of each set of racks will be directly over the racks on the head-blocks G G.

Both of the racks on one side of the groove are connected by a strong bar of wrought iron, C, so that as one rack is pulled endwise, the other rack on the same side must move exactly the same distance. The two

cured in a ratchet-wheel. This ratchet-wheel may be turned in either direction by the lever and paul, thus giving motion to the pinion below. This pinion, through the racks in the groove in log-beam, moves the other pinion in the same direction, and exactly the same distance that it is moved; and both pinions being geared into the racks on the side of the head-blocks across the carriage, any motion given to them must cause the log-beam to move across the carriage, both ends of it moving at the same instant and precisely the same distance, as it is impossible to spring a strong bar of iron by pulling it lengthwise. There are eight cogs on each pinion, and on the racks across the carriage there is one cog to every inch. By turning the ratchet-wheel one-eighth around, the log-beam will be moved just one inch.

It will be noticed from Fig. 4 that the dial-plate is graduated and is furnished with

the pointer on top of the dial-plate. With this log-beam, in use, the log, while being sawed, is braced and supported every few feet, and, at the same time, is held firmly by the self-adjusting dogs, so that there is no possible chance for it to spring. The mill is furnished with friction feed, and, according to present reports, is meeting with a ready sale throughout the country.

Fall of a Suspension Bridge in Germany.

The American Architect records a singular accident which took place not long ago in Germany, recalling, in some respects, the fall of the Bussey Bridge in Massachusetts. A suspension bridge was built in 1851 across the river Ostravitz, between Ostrau in Moravia, and its suburb in Silesia. Instead of ropes, the bridge was sustained by four

about the condition of an iron bridge 34 years old, ordered a special examination by experts. A month later they received notice that the bridge had been inspected in every part, and had been ascertained to be in good condition and was entirely safe. Reassured by this "inconceivable report," as *Le Génie Civil* well calls it, the town authorities allowed it to be freely used, and on at least one occasion this spring there were more than 300 persons on it at once. A few days later, when two carriages, ten persons, and a file of cavalry soldiers, 16 in all, were on the bridge, the suspending chains on one side broke, letting the bridge fall, and killing or wounding a large part of the people on it. There is some reason to suppose that, as in the case of the fall of the famous suspension bridge at Angers, the final strain may have been due to the vibration caused by the measured march of the cavalry, but horses do not often keep step with mathematical

group was found completely rusted and covered with dust in the spot where it had lodged when it dropped, long before, from its place. Of course, a wrought-iron structure, even if originally designed with a factor of safety much larger than usual, would be in imminent danger of falling by its own weight when rust had consumed more than five-sixths of its substance, and a simple calculation showed that the strain on the sound metal at the time of the fall was more than the breaking strain of good wrought-iron; so that the real wonder is that the bridge stayed up so long. The most serious corrosion, strange to say, was found to be under cover, where the chains were anchored on the land side in a chamber of masonry under the parapet; but it seems that foul water from the street had penetrated into this chamber, giving rise, possibly, to acids which would act very powerfully on iron.

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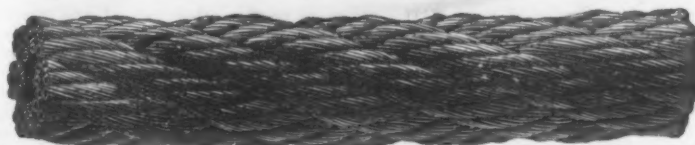
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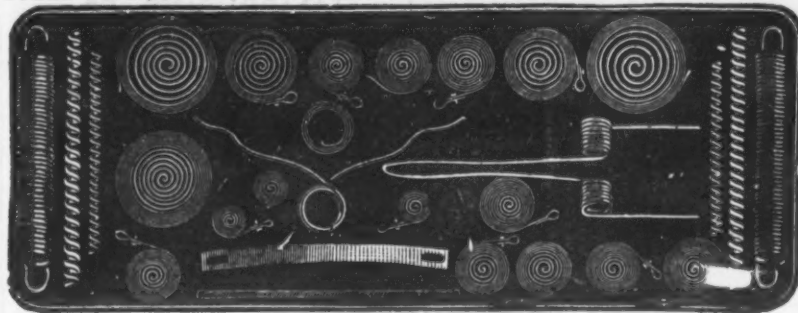
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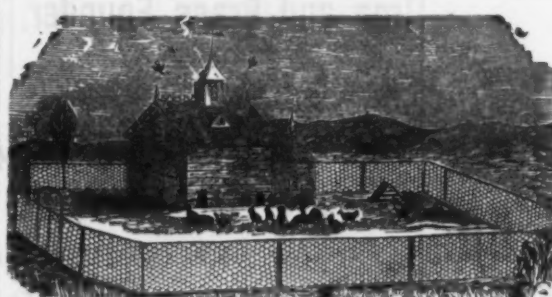
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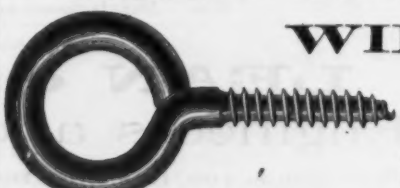
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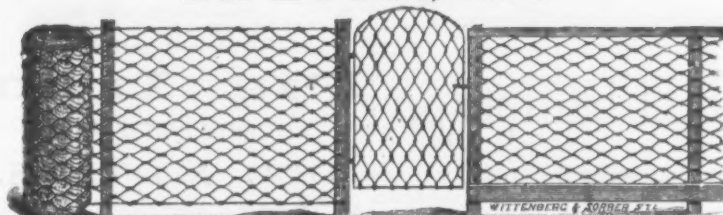
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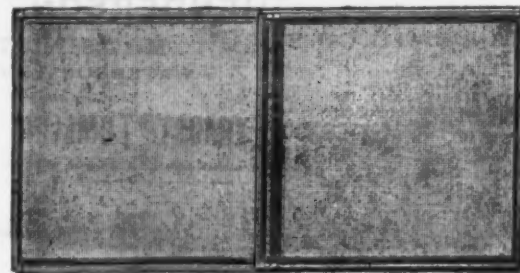
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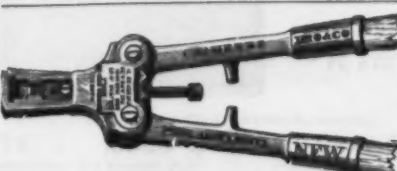
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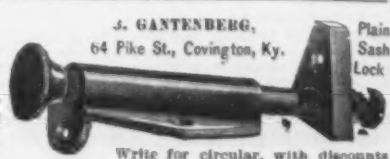
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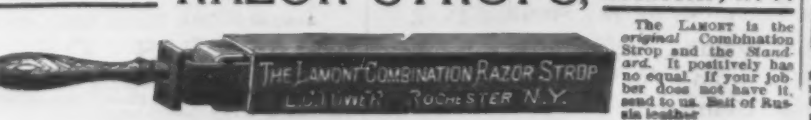
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The popularity of the Adams Swing in the short
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The Swing is constructed on original mechanical
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for both lawn and parlor. No. 1, or largest size,
has standards 9 feet 10 inches long, with a spread
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up or taken down ready for packing in 10 minutes.
The weight of the Swing is a little
less than 100 pounds. It is very
strong, having been tested by four
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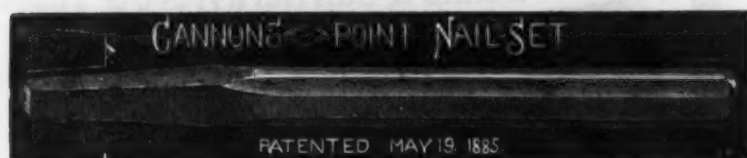
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WEYMOUTH'S PATENT.

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CAUTION.
 We are informed that various parties are infringing upon the widely-known Letters Patent granted originally to GEORGE F. WEYMOUTH for an improved Hay Knife. The invention patented to GEORGE F. WEYMOUTH is embodied in a sword-shaped blade provided with operating handles for breaking the same, the edge of the sword-blade being furnished with knife-edged serrations or teeth. **IT IS OUR PURPOSE TO PROSECUTE ALL INFRINGEMENTS,** and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts. **IT IS OUR PURPOSE TO PROSECUTE ALL INFRINGEMENTS,** and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts. **IT IS OUR PURPOSE TO PROSECUTE ALL INFRINGEMENTS,** and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts.

North Wayne Tool Co.,
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W.H. CARTER'S PATENT NEEDLE HAY KNIFE.
 PAT. APR. 29, 1884.
 IMPROVED BY M.M. BARTLETT.
 Improvement Patented April 23, 1885.

NEEDLE HAY KNIFE, THE BEST IN THE WORLD.
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Improvement patented April 28, 1885, of which we are the sole manufacturers, has been tested with the most celebrated knives of other makers, and has proved an easier and faster Cutter than any other. Its special excellence consists in the chisel-edge tooth shown in the engraving. It may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or any other work for which a hay knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once and a new chisel-tooth appears. It can ordinarily be sharpened with a common scythe stone. Try one and you will give it the preference.

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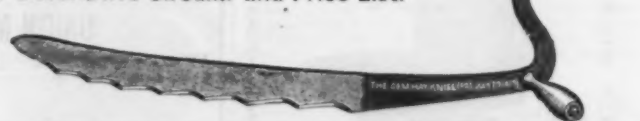
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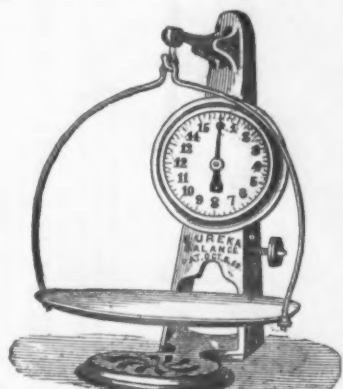
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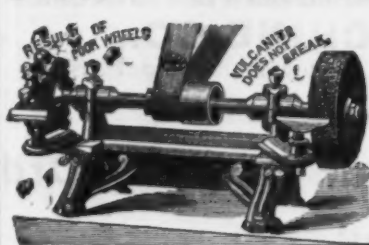
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70 inches wide.

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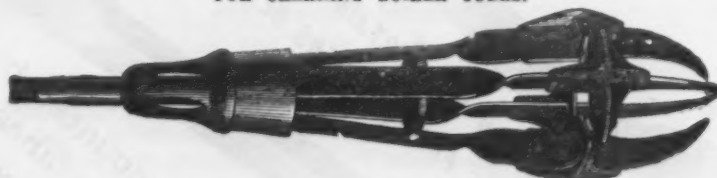
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Duplex Reversible Screw Driver.

TWO SIZES IN
ONE, AND AT
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BEST CAST
STEEL
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A large submarine boat, of the Nordenfolt type, was completed a short time ago for the British Government, and, according to recent advices, has been tested with most satisfactory results. According to the Engineer, it is the fourth boat which has been built by Mr. Nordenfolt, but it is by far the largest and most powerful, while in shape it is different from those supplied to the orders of the Greek and Turkish governments, the latter being pure cigars. The Nordenfolt is a perfect circle at her mid-ship section, and is 12 feet inside diameter. She is a wedge at stem and stern, and is 12 feet deep at both extremities. She is 125 feet long. When acting as a surface boat her displacement is equal to 160 tons, and when fully immersed, 245 tons. She is fitted with peculiar engines, the duty of which is only to turn the main driving propeller. They are double compound—that is to say, two pairs of compound engines working directly on to one crank-shaft having four cranks; in all things else they are quite distinct. The cylinders are 15 1/2 and 26 1/2 inches diameter, with a stroke of 16 inches, and will, it is expected, develop about 1200 horse-power. Specially patented balanced slide-valves are fitted to each cylinder, which valves are driven by Joy's valve gear. A separate pair of engines drives air, circulating and feed pumps, and there are on board beside these two pairs of sinking engines, two fan engines

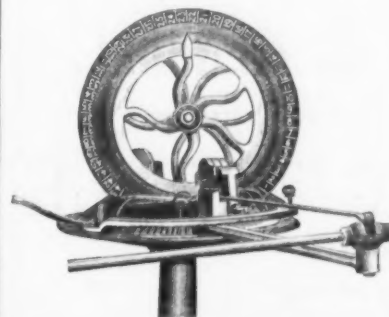


Fig. 3.—Front View of Pointer.

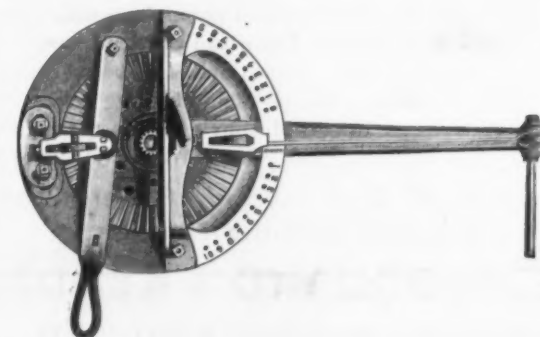


Fig. 4.—Top View of Dial-Plate and Ratchet-Wheel. (See page 1.)

THE HEGE SAW-MILL.

and a pair of steering engines. In all there are on board 14 distinct engines. Steam is supplied by two large marine multitubular boilers, built of steel. They are about 10 feet in diameter, one of them being 20 feet, the other 11 feet in length. As the Nordenfolt lay alongside the jetty before her trial began she was drawing about 11 feet 5 inches aft and 10 feet forward, leaving about 2 feet of her nose, and only 6 inches of her stern out of the water. Immediately in the middle of her length is the entrance to the stoke-hole, through a scuttle some 3 feet in diameter, which is fitted with a heavy steel door having a glass in it, through which light is admitted to the men below. This door is made tight on india rubber, and fastened down by means of a screw and wheel on the inside, which can be worked by the stokers. Fore and aft of this scuttle are placed the funnels, the bases of which stand about 10 inches above the top of the boat, which 10 inches represent the total height of the funnels when she is ready to go below. About 30 feet from the stem and stern of the boat are the conning towers, which stand some 2 feet high, and have the same diameter. They are of 1-inch steel, and are perfectly impervious to any shot which in warfare would ever be directed against them. These towers are fitted with heavy doors, in which are fixed glass cupolas, just large enough to allow of the captain's head to enter when he wants to maneuver the vessel. In the forward tower are placed, at the hands of the commander, means of controlling every motion of the boat; of steering her by steam, of giving her enormous buoyancy at a moment's notice, should it be necessary; of ascertaining her depth under the surface, and whether she is horizontal, and of communicating with the engine-room and stoke-hole. The vessel is divided into five general compartments or divisions: (1) the torpedo chamber, fitted with impulse tubes, in which will be placed two torpedoes; (2) the officers' quarters, which are handsomely and comfortably fitted up for four officers; (3) the boiler-room, which contains two boilers, with the stoke-hole between them amidships; (4) the engine-room, which contains the machinery already described; and (5) the men's quarters, cooking galley, stores, &c.

From the account of the trial we extract the following particulars: As it was intended to exhibit the boat in a semi-submerged condition, the buoyancy was first reduced by the admission of water into the tanks, the funnels being taken down and passed into the stoke-hole, at the same time the furnace doors being close shut and the fires hermetically closed in. The funnel bases being then closed, and the buoyancy reduced until practically nothing remained above the water save the two conning towers and a few inches of her back, the Nordenfolt steamed out of the docks and proceeded at the rate of about six miles an hour. The

neutral tint she was painted rendered her almost invisible at the distance of even a few hundred yards, while as a target she presented nothing to attack save the two conning towers and a few inches of her turtle back, and as these are of great strength, and rendered still more invulnerable by their shape, it is all but certain that no gun carried on any other torpedo boat will ever do her the slightest injury, while she at the same time possesses the enormous advantage of being able to attack without smoke or fire or noise. Indeed, given these advantages of a minimum of target, and a total absence of noise and smoke, we fail to see what more could be desired in any vessel of war. The time occupied by the closed-in trial was about 1 hour and 20 minutes, but a sufficiency of steam is stored up in the boilers to drive her a distance of about 24 miles.

Remarkable Breaks in a Reservoir.

From a paper entitled "Some Remarkable Breaks in a Reservoir," presented by Mr. L. N. Lukens at the last meeting of the Engineers' Club, of Philadelphia, we take the following interesting particulars: The reservoir was built in 1873 on the top of the Conshohocken hill, about 200 feet above the level of the Schuylkill River, from which the water is pumped. In plan it is a square of 151 feet at the top of the embankment, with a division embankment rising half way to the top of the side walls. When ordinarily full it holds about 1,000,000 gallons. The earth of the locality is of a rather light character, with enough talc in it to make it feel rather greasy. The general rocks of the locality are limestone, and the variety quarried and sold as Conshohocken stone. In constructing the reservoir the banks were raised about as much above the natural level as the excavation was beneath it, the earth from the excavation being used for the embankments. These were well rolled and allowed to settle as much as possible in the course of construction. The bottom and sides were then lined with 18 inches of stiff fire-clay, put on in layers of about 3 inches, each layer being well rammed. Above this there was put a brick pavement and this was washed over with hydraulic cement. The inlet and outlet pipes were cast-iron pipes laid in masonry. This masonry was composed of ordinary undressed stone, laid in

hydraulic cement and extended out to about the middle of the embankment. The reservoir was finished in the fall of 1873, and water was let in soon after. In December, 1873, only a few months after the water was let in, the first break occurred. This break commenced just above the outlet pipe and followed the line of the pipe through the embankment, laying bare some of the masonry described as surrounding the pipe. It broke through the embankment just about at the natural level of the ground, and was about 15 feet across at the top of the embankment, narrowing, of course, toward the bottom. The curious part, was, however, that instead of the ground below showing evidences of such a large body of water passing over it, it showed that only a comparatively small part of the water had escaped that way and covered the low land just below. The larger part of the water must have escaped by some other channel, necessarily a subterranean one. This first break was repaired by filling in with stiff fire-clay and finishing as before. In the summer of 1876 the second break occurred. This was in the middle of the west compartment and was an absolute giving way of the bottom, there being no break in the sides. It was simply a hole of about 25 feet in diameter and of indefinite depth. A line was let down at least 85 feet without finding bottom, and stones thrown in seemed to rattle down indefinitely. The ledges of rock seemed to be inclined toward each other, thus V, and the slippery talcous earth had been washed from between them, nobody knows where. Whether the water from the first break started it is of course not known, although it seems, at least, possible. In repairing this, the crevices between the rocks were filled up and arched over with masonry, going as deep as necessary to get a solid support for the masonry, in one case as much as 34 feet below the bottom of the basin. The hole was then filled in with stiff clay and iron ore screenings, principally clay. The top was then plank over with hemlock planks, and the clay lining rammed down and covered with brick, as before.

In the spring of 1879, three years after, the third break occurred. This was in the other compartment, taking away part of the partition wall and part of the bottom, and was a good deal like the preceding one. An interesting fact is that a well near by, 80 feet deep, and which had had 8 or 10 feet of water in it, was completely emptied the night the break occurred and has not held any water since. There must have been some underground channel by which the water from both found its way to the river. This hole was filled up with masonry and clay, like the other. The clay lining was then taken off, and the whole basin—sides, bottom and partition embankment—were plank over with heavy hemlock plank. The clay was then put on again to a

HALL & ELTON'S GERMAN SILVER.

1837



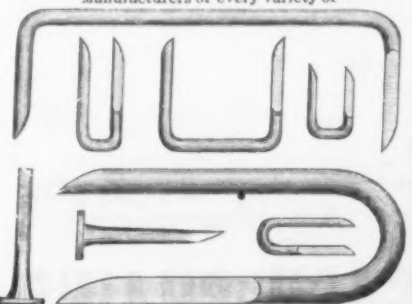
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Will outwear any three harrows.
Does the best work with the lightest draft, and no centre ridges.

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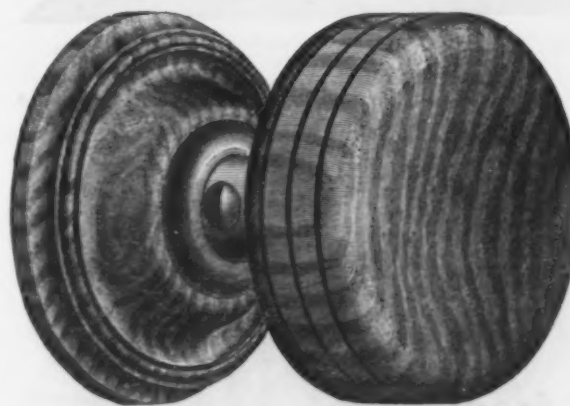
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depth of 14 inches, and the whole surface bricked as before. This time it lasted for eight years, until last fall, when a small break occurred. Some small quantity of water had washed the earth from between two rocks, in the side of and near the bottom of the end embankment, in the same old way. The weight of the superincumbent water had then sprung back the side planks, and the water had escaped by some underground channel. Being relieved of the weight the planks had sprung back. The fact of the springing back and subsequent release is shown by there being a number of small fish caught and crushed in the cracks. This was repaired, as usual, by filling in with fire-clay, and at that particular place there is now 3 feet of fire-clay rammed in between the rocks, then the planking, then 14 inches more clay and then the brick lining. It is hoped now that it will last.

Steering Qualities of Ships.

When the British war ship Ajax was first sent to sea her steering qualities were found to be very defective, especially at high speeds, the most objectionable and perplexing characteristic of her behavior being a tendency to require a large angle of helm to keep her on a straight course. This helm tendency was sometimes on one side, and sometimes on the other, generally remaining the one or the other for some time unchanged, but occasionally changing sides without warning or apparent cause. On such occasions, at full speed, the ship had been found to fly off her course at a right angle before she could be mastered by reversing the helm.

In a lecture on this subject, lately delivered before the Royal United Service Institution, England, Mr. R. E. Froude summarized as follows the causes to which such behavior might be attributed in ships of the type of the Ajax—namely, flat-bottomed and full-ended, particularly in the run: 1. Want of "directive character" (as he puts it) of hull, from the flatness of bottom and fullness of ends. 2. Weakness of action of rudder, from its position in the dead water. 3. An active turning force, consisting in a one-sided pressure on the stern arising out of a one-sided system of flow in the water closing in behind the full run. It was principally to the last-mentioned cause that Mr. Froude, when called upon to investigate the case of the Ajax, was inclined to attribute the behavior of the ship, such a phenomenon having been some years since incidentally observed in the course of experiments made in the experiment tank at Torquay on the resistance of a model having a full run. In this case a lateral force was found to be developed upon the stern of the model, accompanied by a trailing away of the wake to one side, and a transverse flow of the water across behind the stern, in the opposite direction to that in which the lateral force was developed. This one-sidedness of flow and consequent force (like the helm tendency of the Ajax) was sometimes in one direction and sometimes in the other, and occasionally reversed its direction during any experiment; but was generally more or less persistent in direction when initiated, although the direction in which it was initiated was apparently a matter of accident. It was Mr. Froude's belief, founded on these and many other experiments of various kinds, that this species of, so to speak, spasmodic one-sidedness of flow, and consequent one-sided force, attends the motion of all, even perfectly symmetrical, bodies through water, whenever their leaving lines are blunt enough to cause a large eddy behind them.

By way of a method of experiment suitable to test the effect of remedies designed to mitigate or remove either of the three presumable causes of the behavior of the ship, which have been enumerated above, Mr. Froude towed a model of the Ajax in the experiment tank at Torquay, the model being attached to the towing carriage in such a way that, while the model was free to sheer out of the straight course, any such attempted sheering motion actuated a working rudder fitted to the model in the proper direction for frustrating the attempt. By this contrivance the model was made to steer quite straight, and the criterion of the badness of the steering qualities of the model in the several conditions of trial subjected to experiment, was the amount and the degree of unsteadiness of the helm angle administered, this helm angle being continuously recorded throughout each experiment by an automatic apparatus. Thus tested, the model was found to exhibit conspicuously what has been referred to as the predominant characteristic of the behavior of the ship—viz., the large helm angle, sometimes persistently on one side, sometimes on the other, and occasionally changing from one side to the other.

The principal remedies tentatively applied to the model with a view to identifying the main source of the evil, and indicating the direction in which improvement was to be sought, were these: (1) a deep keel, to supply "the directive character" in which the hull itself was presumably lacking; (2) placing the rudder altogether below the keel, so as to be quite clear of the dead-water; (3) an extensive dead-wood (or fixed rudder) behind the stern-post (the working rudder being still below the keel), to frustrate the one-sided flow behind the stern, and do away with the consequent turning force. Of these three kinds of remedy the last-named proved much the most effective—proved indeed an almost perfect cure, thereby confirming the surmise that the one-sided flow at the stern was the chief source of the evil. A minor modification of this dead-wood, with the rudder in its proper place, such as could be practically applied in the ship, likewise proved very tolerably effective, the average helm angle required being reduced to one-third of its amount. On the strength of the results of these experiments, the Admiralty added a structure of this kind to the stern of the ship, with a result which, while it was a remarkable corroboration of the model experiments, was also on the whole a decided success from a practical point of view, the reduction effected in angle of helm being quite sufficient to qualify the ship to steam at full speed in a squadron and keep station satisfactorily.

Ancient Toys.

Puppets, or marionettes, writes the author of the "Romance of Invention," were patronized by both the Greeks and Romans, and automata, which are the inventions with which principally he deals, also go back to a remote period. Vulcan's tripod on wheels has the authority of Homer; Dædalus made moving statues; Archytas, of Tarentum, 400 B. C., invented a wooden pigeon that could fly in the air. In the fifteenth century Regiomantanus made an iron fly that moved through the atmosphere, and afterward an automatic eagle, which, on the arrival of the Emperor Maximilian at Nuremberg, flew forth to meet him. Albertus Magnus is credited with constructing a head that moved and talked, and which so frightened Thomas Aquinas that he smashed it into pieces, Albertus exclaiming when he saw his achievement destroyed, "So perishes the work of 30 years." Roger Bacon made a speaking head of brass, which excited awe among all who heard it. Speaking automata have been frequently attempted of late years, but the great difficulty lies in simulating the human voice. The most successful of these efforts was that of Professor Faber, of Vienna, exhibited in London 40 years ago under the name of Euphonia. Faber worked 25 years at the automaton. The figure enumerated words and also sang. There was an arrangement of hollow pipes, pedals, and keys, which the inventor played to "prompt the discourse."

Willars de Hanecourt, in the 13th century, constructed an angel that "would always point with his finger to the sun." The Marquis of Worcester made an artificial horse that would carry a rider as swiftly as if he were a genuine barb. Philip Camuz invented a wonderful group of automata for Louis XIV—a coach and four horses, that started off with the crack of a whip, the horses prancing, trotting, and galloping in turn; it ran along until it got in front of the king, when it stopped, when a toy footman descended, and, opening the carriage door, handed out a lady "with born grace." The lady made a curtsy, presented a petition to his majesty, and, re-entering her carriage, was driven away. Gen. de Genes, a Frenchman, who defended the colony of St. Christopher against the English about 1686, amused himself by making an automaton peacock, which walked about in all its pride of extended feathers, and picking up corn from the ground swallowed it.

The king of automata constructors was Jacques Vaucanson, born at Grenoble in 1709. While quite a boy he made several self-moving figures. The bent of his mind was determined by a rather peculiar circumstance. Being left to himself in the house of a friend, to which he went with his mother, he perceived through the crack of a partition an old clock with a slowly swinging pendulum which excited his attention. Next time he visited this house he had a pencil and paper with him, and made a rough sketch of the clock. By earnest study and investigation he succeeded in making a clock of his own out of pieces of wood, and his wooden clock kept time fairly well. Then began his experiments with automata. He made a wooden chapel, with moving figures of priests. He invented a hydraulic machine for the city of Lyons, and later, in the same place, perfected a machine for silk weaving that caused the people to rise against him in arms. His first great achievement in automata was his flute player, which was one of the wonders of his time. He had been ill, and made it during his convalescence. The several parts of it were made by different workmen to prevent its discovery. Only a faithful servant aided him in his secret. According to D'Alembert, the remarkable figure stood on a pedestal, in which a portion of the mechanism was concealed, and the player not only blew into the instrument, but with its lips increased or diminished the sound, performing the legato and staccato passages with perfection, and fingering with complete accuracy. It was exhibited in Paris in 1738, and made a great sensation. Vaucanson next made a flageolet player, and later a mechanical duck, which waddled, swam, dived and quacked, and, like De Genes' peacock, picking up and swallowing its food. He was engaged on an endless chain when he died. He willed all his automata to the king.

Mæzel, the inventor of the metronome and of several musical automata, opened an exhibition in Vienna in 1809, with a life-size automaton trumpeter as the chief attraction. When the audience entered all they saw was a tent. After a time the curtains parted, and Mæzel appeared leading forward a trumpeter in the full regiments of an Austrian dragoon. By pressing the left epaulet of the figure he made it play cavalry calls and a march, and an allegro by Weigl, accompanied by a full band of living musicians. Nor was this all. The figure retired and reappeared as a trumpeter of the French Guard. Mæzel wound it up on the left hip, pressed once more on the left epaulet, and it played the French cavalry calls, a French cavalry march, a march by Dussek and one of Peyel's allegros, the full band again accompanying. Kosau exhibited at Vienna an automaton that wrote, and the Drozes, father and son, constructed several mechanical figures that both wrote and played musical instruments. A pantomime in five acts was performed by a troupe of puppets in Paris in 1729, and Blenfalt, in 1746, got up a representation of "The Bombardment of Antwerp," by automata. Another piece performed by Blenfalt's automata, which he called "comedians practicing," was "The Grand Assault of Berg-op Zoom."

A petroleum furnace is being constructed for the Britton Iron and Steel Works, in Cleveland, and the Cleveland Rolling Mill is making experiments in the same direction. An official in the Standard Oil Company's works, in that city, is reported as saying that oil will soon supersede all other fuel in heating boilers and stills in their establishment.

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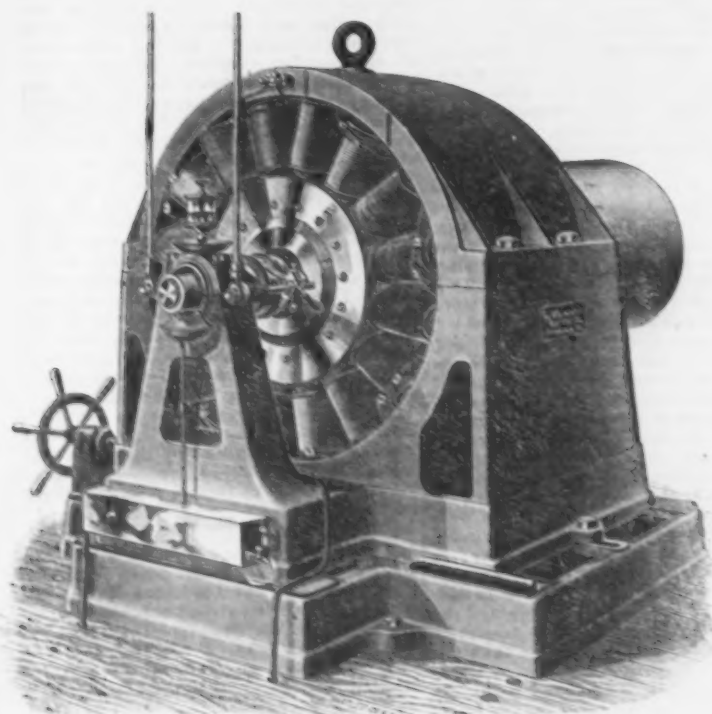
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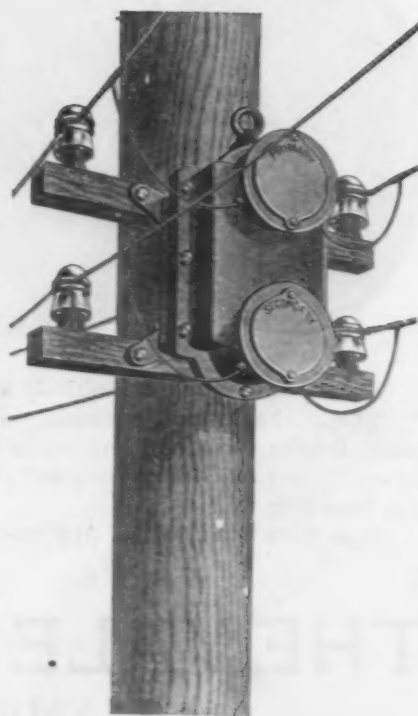
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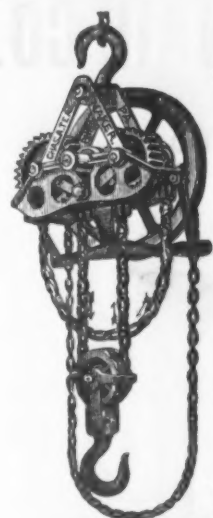
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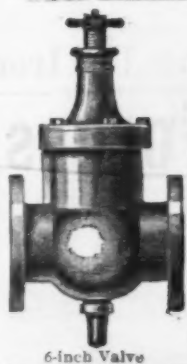
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FRAUDULENT PURCHASE.

D. sold to E. a lot of lumber for \$2500
about June 5, 1884, and E. made a gen-
eral assignment on July 17, 1884. D.
brought an action of replevin to recover the
lumber on the ground that E. must have
been informed of his insolvency when he
made the purchase. It appeared that E. did
not keep proper accounts, only having a
book of sales made; that he owed \$20,000,
of which \$10,000 were secured by mortgage
on his stock of lumber; that he had \$1200
due him for book debts and the stock which
was mortgaged; that he had been embar-
rassed by some land he was carrying and
which he had just got rid of by making
some sacrifices, and that he was unex-
pectedly compelled to make the assignment
because he had been refused a loan which
had been promised to him. In this case—
Dalton vs. Thurston, assignee—the Supreme
Court of Rhode Island decided in favor of
the assignee. The chief justice, Durfee, in
the opinion, said: "The mere fact that a
purchaser is insolvent does not make his
purchases invalid. Though deeply insolvent
there is no presumed fraud. This is not a
question of reasonable expectation, but of
fraudulent purpose. It is not a question
whether the grounds of belief of the pur-
chaser that he could go on in business was
sound and rational, but whether he did so
believe in point of fact. We find nothing to
show in this case but that the purchase was
made to carry on the business as usual."

PARTNERSHIP.

T. gave his note to S. & Co., and they had
it discounted. The day it was due S. & Co.
telegraphed to the bank which held it: "If
T. will not meet his note to-day, he can
draw on me for the amount. L. S." And
later, the same day, L. S. (he was one of the
firm of S. & Co.) again telegraphed to the
bank: "Have learned that T. is away
from home. If he has not left draft with
you, you will please pay note and save pro-
test. You can draw on me. L. S." At the
time L. S. sent these dispatches the firm of
S. & Co. had been dissolved. The bank
drew on S. & Co., but the draft was returned
unpaid. It then drew on L. S. personally,
which was done, but that draft, too, was
returned unpaid. The bank then brought
suit on the note and recovered judgment.
The case on appeal—Seldner vs. Mount Jack-
son National Bank—was also decided by the
Court of Appeals of Maryland against S. &
Co. Judge Robinson, in the opinion, said:
"1. The date of the dissolution of the firm
of S. & Co. seems to be in doubt, but the
date, we think, is immaterial. L. S. had
the right to waive protest of T.'s note as
long as the partnership lasted, and we can
see no reason why the mere dissolution of
the partnership should operate to revoke his
authority. It operated, no doubt, as a revo-
cation of all authority on his part to bind his
former partners by a new contract, but it
did not revoke his authority to adjust, li-
quidate and settle the partnership affairs.
The note was in the hands of the bank, and
S. & Co. knew they could be bound by notice
of protest after demand made upon the
maker, and L. S., when he learned that T.
would not pay the note, he could waive de-
mand and notice, and save the note from
dishonor. By doing this he makes no new
contract, but merely dispenses with a re-
quirement of the law intended solely for the
benefit and protection of the indorser. 2. It
is further contended by the appellants that if
L. S. had authority to waive the protest after
the dissolution of the firm, that he did
not, in fact, waive it; that his telegram
would not bear that construction. It is not
necessary that the waiver be expressed in
so many words. It matters not what par-
ticular language is used, provided it plainly
appears that the indorser meant to dispense
with the demand and notice. It has been
held in many cases that any language cal-
culated to induce the holder not to make
demand or protest is sufficient."

FORGERY.—PUNISHED SIGNATURE.

R. sued his bank for a balance claimed by
him, he having disputed the genuineness of
his signature to a check charged against his
account. In this case—Rose vs. First Na-
tional Bank of Springfield—the cashier testi-
fied that the check had been signed by R.,
and on cross-examination he was shown
several checks signed with R.'s name, which
he said were genuine. They were not, and
R. had judgment. The bank appealed to
the Supreme Court of Missouri and suc-
ceeded. Judge Black, in the opinion, said:
"Papers not in the case cannot be referred
to to establish or defeat by comparison a
disputed signature."

TRADE-MARK.

H. and P. were partners, and they made
and sold two soaps which bore H.'s name as
a trade-mark. Because of H.'s violation of
the partnership agreement a dissolution of
the firm was agreed to, H. selling out to P.
When the firm was formed H. brought into
it, by the agreement, the good-will of the
business he was then conducting in making
and selling these soaps; his tools, imple-
ments and fixtures, and throughout the
business the trade-marks in question were
used. P. associated C. with him, under the
firm name of C. & P., and they made
and sold these two soaps, using H.'s
name on them as a trade mark. H.,
shortly afterward, began making the soaps
again, and gave out that he was the suc-
cessor of the old business of H. & P. H.
then sued C. & P. to restrain them from
using his name on the soaps as a trade mark,
and they, C. & P., sued to enjoin him from
representing that he was continuing the
business of H. & P. In these cases—Hoxie
vs. Charney, and Charney vs. Hoxie—H. was
defeated, and he appealed to the Supreme
Judicial Court of Massachusetts, where he
was again beaten. Judge Charles Allen, in
the opinion, said: "1. A court of equity will
not lend its aid to protect a person in the use
of a trade-mark bearing the personal name
of another, which he claims has passed to
him upon the sale of a business, if the use
of the name carries with it any representa-
tion that the personal skill and labor of that
person was employed upon the making of
the article labeled. But if it appears, as in

this case, that the formula of the person
named only was used, and that the soaps
were made according to this formula was
intended to be conveyed by the use of H.'s
name, then the use of the name cannot be
enjoined. 2. The bill of sale to P. was made
without any agreement that it was to be
taken back into the firm. Its terms were
broad, and although the trade marks and
good-will of the firm were not expressly
mentioned, both are included within its
meaning. 3. As there was no stipulation
in the bill of sale that H. should not carry on
a similar business, he may engage in the like
business, but he cannot represent himself to
be the successor of the business which he
has sold to another."

ARBITRATION.

C. and B. were partners and they dif-
fered about their accounts after they had
dissolved. They agreed to arbitrate the
matter in dispute, and the arbitrators made
an award to which B. refused to accord.
C. sued on the award, and B. set up in de-
fense, that as neither the arbitrators nor the
witnesses were sworn the award was not
binding on him. He was defeated, and car-
ried the case—Cochran vs. Bartle—to the
Supreme Court of Missouri, where the judg-
ment was affirmed. The chief justice,
Norton, in the opinion, said: "The award
is valid though the arbitrators and the wit-
nesses were not sworn, notwithstanding the
statute requires the arbitrators to be sworn.
The parties may waive the taking of the
oaths in both cases. In this case the oaths
were waived, for one of the arbitrators
stated at the first hearing that the arbitra-
tors had not been sworn, neither had the
witnesses, and therefore he supposed that all
formalities were waived. This was dis-
puted on the trial, but the jury found in
favor of the plaintiff, and that binds us.
The judgment must stand against the de-
fendant."

NEW PUBLICATIONS.

SCREW THREADS. By Paul N. Hasluck. Size, 3 1/2 x
3 1/2 inches, 79 pages. Published by Crosby,
Lockwood & Co. Price, 40 cents.

Of the large number of popular little
handbooks of workshop manipulations which
have been published within the past few
years, Mr. Hasluck has contributed a no
mean proportion, his latest work being a
vest pocket edition of a book on screw
threads, screw cutting, &c. A condensed
exposition of the subject, such as he has
given, will, no doubt, be received favorably,
and those who will examine it with a view of
getting information which may be readily
applied in practice will not be disappointed.
There are five chapters devoted respectively
to sewer threads, dies and die stocks, screw
cutting on lathes, cutting complex thread
rates on self-acting lathes, and tap making.
The screw-cutting lathe, its principles and
action, are discussed, and the several forms
of standard screw threads are illustrated.
The subject throughout is treated in a very
simple manner, without the usual, though
unnecessary, complications.

MANUAL OF SCREW CUTTING. By William Stimp-
son. Size, 3 1/2 x 5 1/2 inches, 31 pages. Published
by S. Woodberry & Co. Price, 30 cents.

The fourth edition of this little book, which
has just been issued, would seem to testify
to its popularity. It embraces short chapters
on the lathe, the screw and its use, and on
the driving screw, and gives a series of
rules for screw cutting, cutting double and
treble threads, &c. A few simple rules
have also been added in this edition for de-
termining the speeds and diameters of
pulleys, and length of belting. The con-
cluding pages are given up to tables of the
United States and the Whitworth standard
threads for screws and gas pipes, the United
States' standard for bolt-heads and nuts,
figures for the safe working strain of bolts,
and examples illustrating the various rules
presented.

Accidents to Railroad Employees.—
In a report by a committee on accidents to
trainmen, presented at the recent meeting
of the Master Car Builders' Association, it
was estimated that about 1426 railroad em-
ployees are killed annually and about 6548
injured. In the following table the per-
centage which the number killed and injured,
under each of the headings, bears to the
total has been calculated:

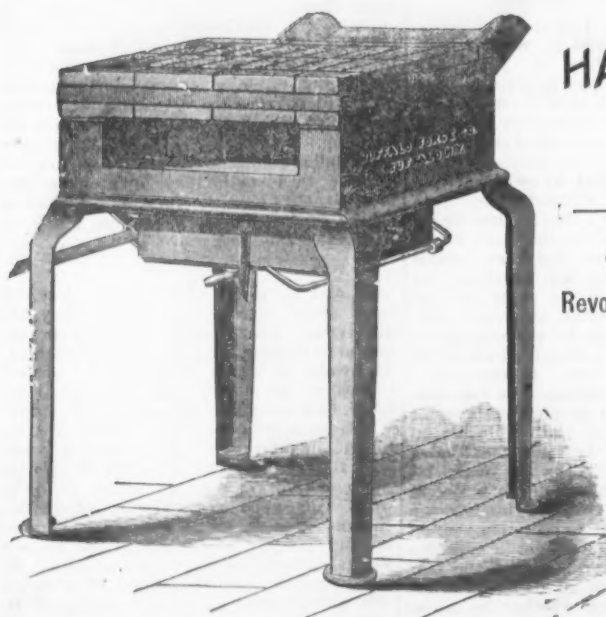
	Killed.	Injured.
Coupling or uncoupling cars.....	13.1	46.5
From accidents.....	15.7	11.1
Falling from trains or engines.....	47.4	18.5
Various causes.....	38.8	24.4
Total.....	100.0	100.0

This shows that nearly one-half of the
injuries are from coupling cars, but that the
percentage of fatal accidents from that
cause is only 13.1, whereas 27.4 per cent.,
or more than twice as many, are killed from
falling from trains or engines, but only 18.5
per cent. of the injuries are due to that
cause.

The National Agricultural Exposition has
been organized at Kansas City, James
Goodin being president, Hamilton S. Wicks,
vice-president and secretary, and J. W.
Ryckman, manager. The main exposition
hall that is being erected will be completed
on the first day of September next, and will
be constructed substantially of stone, brick,
iron and glass. It will be 450 feet long by
255 feet wide, and will contain 6 acres of
floor space. The design is unique and re-
sembles somewhat two Latin crosses, with
wings extending out from the junction in the
center. Handsome towers and domes will
ornament the sides and ends. Although the
name of the exposition is the National Agri-
cultural Exposition, yet every leading in-
dustry will be given prominent space for
display. The exhibition will be open from
September 15 to November 1.

The people of Paola, Kansas, have fol-
lowed the example of Findlay, Ohio, in
celebrating the discovery of natural gas in
their vicinity. On the 25th ult. a great pub-
lic demonstration in honor of the event
occurred at Paola, which is estimated to
have attracted 15,000 people to that town.
A gorgeous illumination is said to have taken
place in the evening.

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Style H, Maple Sheave, Metaloid bushed, \$3.50 per doz. Net
" L, Lig. " " " 4.50 " " " "
" K, Iron " " " 6.25 " " " "
" O, Maple " " " 3.00 " " " "

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New York Agency, **HENRY B. NEWHALL CO., NEW YORK.**

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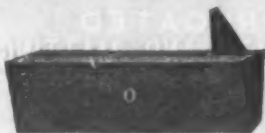
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A Perfect Beater
AT A
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The Easy Beater can be obtained only through the
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Successor to C. F. Dewick & Co.,
Manufacturer of
PATENT STEEL
Toe Calks,

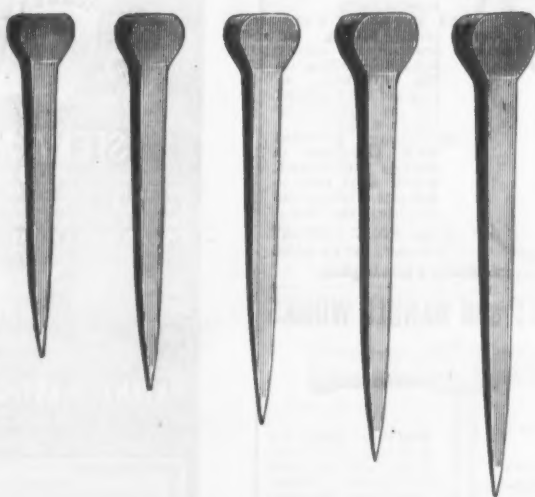


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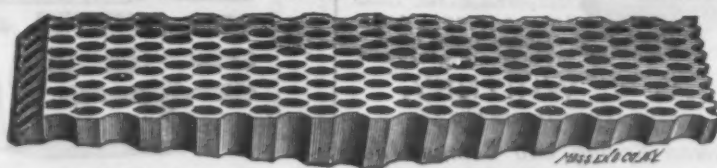
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BRAIDED WIRE PICTURE CORD,
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FOR FINE CUTS SEND TO **KYES & WOODBURY,**
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English Letter.

(From Our Regular Correspondent.)
LONDON, June 20, 1887.

THE JUBILEE
is upon us at last in all its intensity, and it is quite patent that the whole of this week will be given up to "jubilation" in one form or another. The official celebration does not commence until to-morrow, but to-day the city proper is almost impassable, and it is estimated that by to-morrow evening the ordinary population of about 5,500,000 will be augmented by another million. As the whole affair will have been described by cable in your daily papers long before this letter reaches you, I shall only remark in this connection that the Jubilee preparations and doings have at last given a tremendous fillip to many branches of trade. For gas piping and tubes, burners, wire and fancy devices, crystal shields, banners and the like, the demand has utterly paralyzed the sources of supply, and the producers have simply collapsed under the call which has been made upon their resources. Workmen have been "at it" night and day, and have not overtaken their tasks. For knives, forks, tableware, &c., &c., a similar demand has existed, which is not to be wondered at, seeing that pretty nearly the whole of the lower classes throughout the country will be feasted gratuitously to-morrow. Certainly no such event has ever before been so generally observed in this or any other country. The decorations and illuminations surpass everything the world has ever seen, and the throng of visitors, from kings and princes downward, is literally astonishing. Among others it is estimated that we have nearly 150,000 Americans in London at the present time, most of them trying hard, and successfully, to get a fair amount of enjoyment out of the festivities of this effete old monarchy. Among others, Mr. Andrew Carnegie is giving almost regal hospitality at the Hotel Metropole, where he has engaged one of the best suite of rooms, and will to-morrow entertain a host of his American and English or Scotch friends. Mr. Carnegie is reported to have enjoyed his wedding trip hugely. As to business proper, I fear there is little to be said. I met a man this morning who had made five calls and found nobody in, so that, as I have said already, the week is to be given up to holidaying.

The iron markets have been steadied by the continuance of the remarkably fine and blazing hot weather, which tends to a lessening of the production at the iron and steel works, while also raising the hopes of the farmers and others, to whom the weather is always a serious consideration. It is anticipated that such weather with you will also lead to many of the mills and forges being laid off, and so send some orders to this side. Already, as I cabled to you on June 15, orders for some 10,000 tons of Scotch pig have been received at Glasgow. One order was for 3000 tons and another for 2000 tons, the balance being made up of smaller lots. All were for No. 1 iron of special brands. These orders are attributed to the coke strike, but it is not certain that such is the case. It is hoped that it is not, in which case there will be the chance of further orders coming over. The collapse of the wheat corner is welcomed by exporters, as its break-up will give them a larger supply of outward vessels at lower freight rates, and so enable them to make c.i.f. prices at United States ports much lower than they have been of late. I am unable to trace any large American orders for hematite or Cleveland pig, but there are numerous inquiries here for blooms, billets, scrap iron and old rails, and in these old materials negotiations are likely to lead to the placing of orders of some importance.

THE IRON MARKET
has maintained its encouraging features, and in some respects these have become more marked. The Glasgow warrant has been upward in tendency, closing 42/2, chiefly owing to some good sales on United States account of No. 1 special brands. Makers' brands, however, have profited by them, and, coupled with the reduction of the temporary number of furnaces in blast, makers hope that the improvement will be carried further. In Cleveland an advance is chronicled, buyers being more willing to pay 6d. better than they offered a fortnight ago. Makers, however, have cared little about selling under 35/ for prompt delivery, and only a few parcels have changed hands. In this market the encouraging conditions are freely admitted, and hopes, on the whole, are higher than they have been for many months. On the West Coast makers remain well employed upon orders for shipment booked several months ago, and it is reported that further orders have just been given out for a large quantity of hematite pigs for the United States. Meantime mixed numbers are nominally quoted about the same as before. In Staffordshire there is little or no change, the slight movement elsewhere observable not having manifested itself in this district. Business done has therefore been of a comparatively unimportant character. Sheets, especially black ones, are stiffer, owing to the necessity to lay off some of the mills on account of the hot weather, and greater firmness has ruled in galvanized sheets. Prices, however, have not advanced. In most other finished branches a little better condition is reported. Buyers are showing greater willingness to do business, especially in bars and rods. Angles and tees have also attracted rather more attention, while in heavy work and bridge building materials not only have some good orders been placed recently, but further specifications have been issued by the India Office and some of the Indian railway companies. Old rails are scarce, and buyers from the United States have shown a desire to close within certain limits, but then offers have not been sufficiently tempting, and, as holders are determined to stand out for their own terms only, little business has been done. F. Pitt & Co., London, quote old D. H. rails, 55/; heavy wrought scrap iron, 47/6 @ 50/; iron fish plates, 62/6 @ 65/; and leaf spring steel, 53/6 @ 55—all f.o.b. London or other good port. Scrap is very scarce. Freight remains firm, with a tendency toward an advance for nearly all ports.

Steel is much in demand, and almost without exception the works are well employed. Business in blooms has been done at about 75/ f.o.b., fully 2/6 advance upon what buyers offered last week. Siemens-Martin billets are quoted f.o.b. Glasgow 92/6, and basic billets at the same port, 72/6 1/2 ton f.o.b. Steel rails have been in request this week for the United States, and rumors concerning the sale of several thousand tons have been in circulation. The 5000 tons of 36 lb section required by the Chinese Government for the construction of the Formosa Railway, have been placed with the West Cumberland Iron and Steel Company (Limited), at a price (including the fish plates, &c.), of about £4. 8/ 1/2 ton, leaving for the rails between £4. 2/ and £4. 2/6 1/2 ton. Since that transaction was concluded, other rails of about the same section have been sold in South Wales at about (for rails only—no fish plates, &c.) £4. 5/ 1/2 ton, f.o.b. Newport.

SCOTCH PIG IRON
is steady at the moment under the circumstances just described, and there is a very hopeful tone in the market. There are 80 furnaces at work, as against 85 a year ago, two having been relighted last week. In Connal's stores there are 885,151 tons (an addition last week of 3000 tons) as compared with 776,214 tons a year ago, or an average increase of 3000 tons a week. Warrants are 42/5 @ 38/4 this date in 1886. Shipments to date are 4533 tons behind hand, while the importations of Middlesboro' pig into Scotland are 13,025 tons ahead this year.

MIDDLESBORO' PIG IRON
is steady, and inclined to greater firmness at the rates currently cabled to you. The smelters are trying to weed out the bears by refusing to sell forward, and are meeting with some success.

HEMATITE PIG IRON
is also steady at the following rates for West Coast makers' brands.

	No. 1.	No. 2.	No. 3.
Cleator.....	46/6	44/	46/
Lonsdale.....	44/6	44/	43/6
Workington.....	44/6	44/	43/6
Lowther.....	44/6	44/	43/6
Distington.....	44/6	44/	43/6
Solway.....	44/6	44/	43/6
Maryport.....	44/6	44/	43/6
Harrington.....	46/	45/	44/

There are 54 furnaces at work, as compared with 41 a year ago. Stocks in stores only are 216,162 tons—an increase of 85,132 tons since Christmas last. Pig iron shipments are 10,129 tons ahead, and rail shipments, 85,132 tons ahead.

TIN PLATES.
In London the market is stronger and with a good business doing at the time of writing, it is not easy to place orders below 13/ f.o.b. Liverpool for ordinary brands of 10 cokes. At Liverpool firmness of tone and steadiness of prices still characterize most of the movements in the tin-plate market. Terne plates and certain sizes of tin plates—such as 14 x 19 1/4 and 19 1/2 are scarce. The majority of the works seem to be pretty full of orders. Terne plates continue to be much sought after for forward delivery, and so also are 14 x 20 cokes and Bessemer steel cokes and 10 x 20 Siemens steel plates. There are numerous inquiries for special sizes in Siemens steel plates with coke finish and in assorted specifications. Quite a new feature in the tin-plate business is the large number of light weight plates that are required for the States now. These are being asked for chiefly in 14 x 20 size. There is a good demand for coke tin and Bessemer steel coke-wasters. In charcoal tin plates very few specifications have been received. Coke tin plates are quoted 13/ @ 13/6 10 c; Bessemer steel cokes, 13/3 @ 14/ 10 c; Siemens steel cokes, 13/9 @ 14/3 10 c; coke tin wasters 12/3 @ 12/6, and Bessemer steel coke wasters 12/7 1/2 @ 12/9, all f.o.b. Liverpool. Terns are 24/6 up to 27/; Welsh shipping ports; wasters 22/6 @ 23/6. The price of 19 1/4 x 14 tin plates, is as a rule 13/, though some parcels of certain brands were sold at 12/10 1/2, and 10 x 20's are firm at 10/, Wales.

THE HARDWARE TRADES.
In London the outlook is undoubtedly far and away better than has been experienced for some time. Not only are there less complaints than usual, but there is a degree of briskness in various branches of trade which is most encouraging. Those who held large stocks of ware for illuminating purposes were a month ago agitated by many doubts; now affairs have taken such a turn that the demand cannot be met, and holders have done many a good stroke of business. In the decorative and gas-fitting departments, the requirements of the hour exceed all ordinary means of supply, overtime on a large scale being invoked to grapple with the difficulties of the situation, and even then some of the houses which make a specialty of that class of work have been obliged to refuse orders. Cheap knives, forks and spoons have had quite a run, the festivities of the coming week creating a demand, of which traders have not been slow in taking advantage. At Birmingham production is rather active just now in the local hardware branches, as a consequence not so much of any marked improvement of demand as of the frequent interruptions caused by holidays, and the necessity, therefore, of making the most of an unbroken week. The jubilee has rather disappointed expectations as regards general goods, but medals and badges can hardly be turned out fast enough to meet the demands, and the makers of gas tubes and fittings and glass lamps are also benefitting to some extent by illumination orders. The Germans, however, seem to be getting the lion's share of the glass lamp trade, in virtue of their low quotations. At Sheffield no change is to be noted in the general condition of trade in the district. The improvement in the file trade noticed last week continues, and, besides the heavy branches, the other trades that are doing better are spades, shovels, and mining tools, saws, and edge tools (with exceptions). The cutlery and plating trades are, however, in a languid condition. There continues to be a demand for steel, and although prices are not any better, there are indications of an encouraging character. I understand that some Government contracts have recently been placed.

A NEW DEPARTURE! THE SMITH & WESSON HAMMERLESS, SAFETY REVOLVER

Provided with Automatic Shell Extractor, Rebounding Lock.

Calibres 32 and 44

IN

PREPARATION.



Calibre 38,

Weight 18½ oz.

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SMALL NAILS, ALL STYLES,

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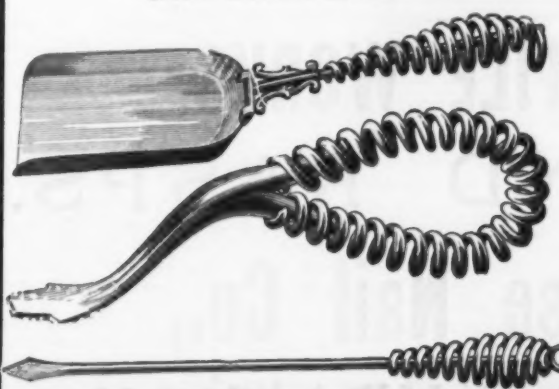
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Electro-Plating TO ORDER.

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Spelter, Iron, White Metal, &c.

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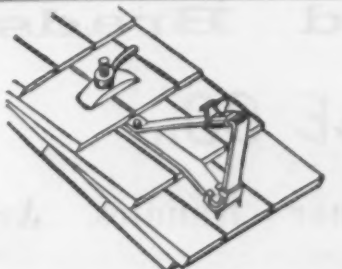
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Adamant Powder Co.,
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BEST AND SAFEST BRACKET MADE.

Endorsed by all who have occasion to go upon roofs. Can be attached instantly to any roof. Made of best wrought-iron, and warranted strong and durable. Fastened to the roof by inserting under the shingles and clamped. No nails used. When once fastened cannot slip or tear the shingle. Address: P. W. RYAN, Box 201, Marlboro, Mass.

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Oval, Half Oval, Half Round and Grooved Iron, and IRON AND STEEL NAILS, 3-penny fine to an 8-inch Spike.

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All orders or inquiries will meet with prompt attention.

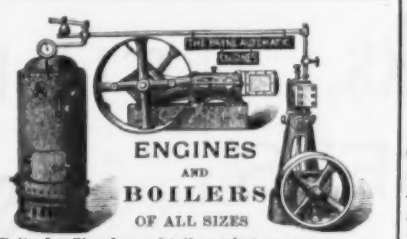


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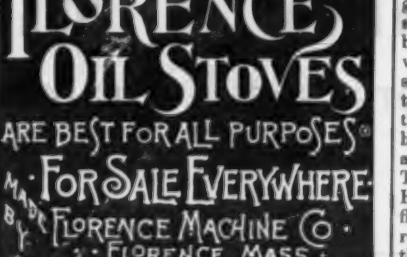


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Improved Planers a Specialty; 20 x 30, 22 x 32, 24 x 24, 26 x 36, 30 x 36, 36 x 36, to plane any desired length. Send for Description and Prices before Purchasing.



Meeting of Makers of Chilled Cast-Iron Wheels.

On January 27, 1887, a meeting of chilled cast iron wheel makers was held at the Gilsey House, New York, for the purpose of endeavoring to effect uniformity of methods of dealing with railway companies. There was considerable discussion, and the meeting finally appointed a committee on permanent organization, with instruction to report at a meeting to be held at Minneapolis at the time of the meeting of the Master Car Builders' Association. The meeting convened at Hotel West, Thursday morning, June 16. Mr. W. W. Snow was in the chair, and Mr. W. K. Chapin and John R. Whitney, chairman, reported a series of resolutions, in which they recommended that no permanent organization be formed, but that there be an agreement to meet annually. It was decided, however, to form a permanent organization, and a committee was appointed, consisting of Messrs. Snow, Chapin, Whitney, White and Hecker, with instructions to report to a meeting to be held at 3 o'clock p. m.

At the afternoon meeting a constitution was adopted, which is to be printed and sent to all car-wheel makers. Meetings are to be held at the call of the Board of Managers. The following officers were elected: Hon. W. H. Barnum, president; J. H. Barr, vice-president; W. W. Lobdell, secretary; N. P. Bowler, treasurer. Board of Managers, John R. Whitney, Frank J. Hecker, W. W. Snow, N. S. Bouton, E. B. Tippet. Papers by W. H. Barnum, John R. Whitney and E. B. Tippet were referred and read to the Board of Managers. A committee which had invited the Master Car Builders' Association to appoint a committee of conference was continued, with instructions to wait on the Master Mechanics' Association and request the appointment of a similar committee. The association then adjourned, subject to the call of the Board of Managers.

The following manufacturers were present at the meeting: Ramapo Wheel and Foundry Works, Ramapo, N. Y.; Rochester Car Wheel Works, Rochester, N. Y.; A. Whitney & Sons, Philadelphia, Pa.; Bowler & Co., Cleveland, Ohio; Terre Haute Car Works, Terre Haute, Ind.; Missouri Car and Foundry Company, St. Louis, Mo.; Geo. H. Thacher and Co., Albany, N. Y.; Cayuta Car Wheel Works, Sayre, Pa.; Bass Foundry and Machine Works, Fort Wayne, Ind.; J. H. Bass, Chicago, Ill.; St. Louis Car Wheel Company, St. Louis, Mo.; Griffin Wheel and Foundry Company, Chicago, Ill.; Ohio Falls Car Works, Jeffersonville, Ind.; Lobdell Car Wheel Company, Wilmington, Del.; Barnum Richardson Company, Lima, Rock, Conn.; Peninsular Car Works, Detroit, Mich.; Menzel & Ferguson, Minneapolis, Minn.; Barnum & Richardson Mfg. Company, Chicago, Ill.; Ensign Mfg. Company, Huntington, W. Va.; Washburn, Hunts & Co., Jersey City, N. J.; C. A. Treat Mfg. Company, Hannibal, Mo.

Experimental Cast-Steel Guns.—During the last session of Congress, an appropriation of \$20,400 was made and authority given the Secretary of the Navy to expend it in purchasing three steel cast, rough bored and turned, 6 inch, high power rifle cannon of domestic manufacture. This proposal was issued on the 29th ult. The law specifies that one shall be of Bessemer steel, one of open hearth steel and one of crucible steel. The proposals will be opened on August 2. Proposals may be made either to furnish three completely finished cannon, made from unforged castings, or three unforged, rough bored and turned castings for such cannon, of the same material respectively, to be finished by the department in accordance with the bidders' design. Each gun, when completed, must be capable of safely discharging projectiles weighing 100 pounds each, with a muzzle velocity of not less than 2000 feet per second. No gun or casting for a gun will be paid for until the gun shall have been completed and have successfully stood the statutory test required by the act of July 26, 1886. No proposal will be considered unless accompanied by satisfactory evidence that the bidder controls a plant adequate to the production of the gun or guns, casting or castings which he proposes to furnish. The proposal, so far as the navy is concerned, is a novel one. The army has a cast-iron gun at Sandy Hook of the largest caliber, which has been fired many times and has been favorably reported upon. The test now proposed for the navy will give the advocates of cast-steel guns the fullest opportunity to demonstrate what they so persistently urged upon the Appropriation and Naval Committees of both houses of Congress. Officers of the navy, too, are interested in the result, since the Navy Department is now building up a great gun plant at the Washington Navy Yard, where the guns advertised for may have to be completed.

A Simple Form of Electric Pen.—A description has been given by Dr. J. Carel in the *Electrician* of a simple way to make an electric pen for multiple copying of letters or drawings. A tracing of the drawing to be copied is taken on thin paper, which is then laid upon a piece of common gas carbon. The larger the carbon in proportion to the paper, the less shifting will be required, but a piece of reasonably convenient size may be easily found, and it should be ground to a fair surface. The plate of carbon thus prepared is to be connected with one of the screws of a small induction coil, such as that used for an electric bell. The style for following the design, says a contemporary, is nothing more than a lead pencil, rather hard and brought to a fine point. The other end of the lead of the pencil is connected by a wire with the other screw of the induction coil, which in turn is connected with a suitable battery. The wood of the pencil effectually insulates the current from the operator's hand. The arrangement being thus completed, all that is necessary is to follow the design, or to write the letter upon paper resting on the block of carbon, leaning lightly upon the pencil. As the graphite point proceeds, a continuous succession of small sparks flow between it and the carbon, and the intervening paper is accordingly

perforated by an infinite number of small holes burned by the sparks. These holes are barely visible to the naked eye, except by holding up the paper to the light, but they can be utilized for transferring the design or writing to paper, either by dusting on a powder or passing an inked pad over the perforations when laid on the recipient.

Foreign Markets.

FRANCE.
PARIS, June 25, 1887.—Metals.—A moderate local demand has prevailed, with steadiness in Copper and Spelter, and a slight decline in Tin and Lead. We quote at the close in francs per 100 kg: Copper, 102.75; Best Selected, 113.25; and Pure Corrocor Ore, 105. Tin—Banco, 277.50; Billiton, 273; Straits, 271.25; and English, 271.25. Lead, 31 @ 31.75, and Spelter, 38 @ 38.50. Iron.—The iron market in France has remained depressed during the week; it is difficult to revive it. Besides, the latest news is not favorable; thus the Orleans Railroad Company have resolved to indefinitely postpone the intended ordering of 6000 freight cars, nor are the orders for the Paris exhibition building forthcoming. In consequence of the many disappointments iron prices are weak in France; in this city it is not easy to get 12.50 francs for Beams and 13.50 for Merchant Iron. Finished castings are being made on all hands by holders.—*Moniteur des Interests Matériaux.*

Imports.			
	1887.	1886.	1885.
	Tons.	Tons.	Tons.
Iron Ore.....	450,324	435,564	443,139
Cast Steel.....	52	52	5
Steel Rails.....	87	49	5
Other Rolled Steel.....	604	614	1,084
Wrought Steel.....	48	68	91
Pig Iron.....	31,982	22,139	27,996
Old Iron.....	4,495	2,791	7,308
Iron Wire.....	1,154	940	2,675
Iron Rails.....	27	7	85
Sheet Iron.....	392	392	398
Other Finished ditto.....	1,314	1,306	1,750
Nails.....	216	180	131
Wrought Iron.....	1,154	1,118	1,007
Castings.....	232	222	192
Total.....	492,305	465,293	485,565

Exports.			
	1887.	1886.	1885.
	Tons.	Tons.	Tons.
Iron Ore.....	55,486	39,715	58,763
Cast Steel.....	387	1,074	58
Steel Rails.....	17,872	7,127	15,829
Other Rolled Steel.....	6,059	7,840	999
Wrought Steel.....	435	418	432
Pig Iron.....	4,016	8,317	2,174
Old Iron.....	6,616	9,442	1,090
Iron Wire.....	1,833	775	597
Iron Rails.....	3,596	2,335	1,516
Sheet Iron.....	14,699	11,730	9,896
Other Finished ditto.....	6,045	7,543	60,638
Nails.....	2,882	2,096	2,398
Wrought Iron.....	7,537	8,237	7,865
Castings.....	3,439	6,851	4,955
Total.....	230,826	164,500	167,542

GERMANY.
HAMBURG, June 25, 1887.—Iron.—Our Dortmund correspondent reports a more irregular iron market in Rhineish-Westphalia during the week, closing steadier and somewhat firmer. The syndicate of class-furnace owners was induced to lower prime forge pig iron from 48 marks to 45.50, and Thomas from 45.50 to 43.50, so as to conform somewhat to the Siegen price reduction to 40 marks and less, the 3.50 difference being the difference in freight, higher from Siegen. Buyers expecting a reduction were holding back; it is now expected they will come forward for the third quarter. A similar reduction in Spiegel has so far failed to revive the export demand. Bessemer, Foudry and Luxembourg have meanwhile been fully sustained. Consumers of finished iron still hesitate about contracting much ahead, but specifications are coming in with tolerable promptness. The latter circumstance enables makers to keep up a steadyness in their output; they will be able to continue so for a couple of months to come, even in the event of fresh commands remaining comparatively trying. Some leading makers would, indeed, not engage to deliver on new contracts before the middle of August. The formation of further syndicates in both the Pig and Finished branches is still a subject of active negotiations. As for the general outlook in the Rhineish-Westphalia Iron and Steel branches for the second half of the year, it may be stated without hesitation that it is most reassuring, without leaving room for any sanguine expectations, however. At ruling prices the iron situation is undoubtedly sound in Europe; as a general business prospecta are at the same time fair, an active fall trade is confidently looked forward to, with the possibility of a rise. In consequence of the weakness therein at Siegen, this sheet iron situation is undoubtedly sound in Europe; as a general business prospecta are at the same time fair, an active fall trade is confidently looked forward to, with the possibility of a rise. In consequence of the weakness therein at Siegen, this sheet iron situation is undoubtedly sound in Europe; as a general business prospecta are at the same time fair, an active fall trade is confidently looked forward to, with the possibility of a rise. In consequence of the weakness therein at Siegen, this sheet iron situation is undoubtedly sound in Europe; as a general business prospecta are at the same time fair, an active fall trade is confidently looked forward to, with the possibility of a rise. 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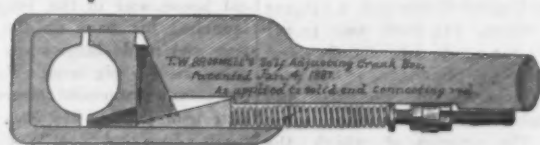
We show on this page an 18-inch improved wye level, just being put upon the market by William Gardam & Son, 96 John street, New York. The device has several features of improvement about it that render it of interest to architects, engineers, and all who have to do with leveling operations, whether about buildings or in running lines in connection with engineering work. The special feature of the device is the provision that is made for quick leveling and setting up on a very rough and uneven ground. The design of the upper part is similar to the regular wye level and contains the improvement which the firm above-named have put into the usual form of this article—viz., the clamp and tangent revolving with the telescope, long center telescope, and spirit level as close to the center as possible, improved clips to the wyes, &c. The design of the lower part of the present device, is new, and contains improvements recently patented. Our engraving shows in detail the construction, operation, and manner of detaching the upper part of the instrument from the parallel plates, and also shows distinctly the form of socket and the manner in which it is attached to the parallel plates. The clamping ring and spring catch are also indicated. In using the instrument, the operator proceeds as follows: After screwing the parallel plates to the tripod head, the socket B is inserted in the cavity provided for it, and is then turned to the left until the spring catch A drops over the edge of one of the flanges on the socket B. This is simply to prevent it being turned backward. The ring A is then screwed down, which causes it to grip the socket B firmly, which holds the instrument perfectly rigid and completes the preparation for use. By slightly unscrewing the ring A the instrument can be moved to any angular position at will. The amount of friction and bearing surface is so great that it is claimed there is not the slightest chance of the instrument shifting when being used. The simplicity of the device, the makers inform us, is so great that they guarantee that it cannot get out of order with ordinary care and use. The weight of the instrument is 12 pounds, and the tripod 7 pounds. The telescope is 18 inches long, and the object glass $1\frac{3}{4}$ inches in diameter and of the highest magnifying power obtainable.

Application of the Abt Rack-Rail System.

It is stated that the Abt rack rail system is to be tried on the English military railroad through Bolan Pass, on the Afghan frontier of India. Materials for 10 miles of road have been sent out with two locomotives, and the road will be laid this year. The success of the Abt system on the Harz Railroad has attracted much attention, and this Indian case is only one of several proposed applications of the system.

Self-Adjusting Crank Boxes and Connecting Rods.

Mr. T. W. Broomell, of Christiana, Pa., is putting on the market an ingenious self-adjusting device for crank boxes and connecting rods. The cut which we present shows the arrangement so plainly that an elaborate description is unnecessary. It will be noticed that a combination of wedges is employed. The boxes are fitted in the usual way, except that the one on which the wedge acts has a free fit. In cutting the opening in the rod, one end is cut on an angle of any degree that may be required; it is also slotted back to receive a small wedge, acted on by a steel spring, as shown. This spring is inserted through a hole in the rod, its outer end resting against the head of an adjusting screw. After the boxes and wedges are put in place, the spring is put in and compressed by the nuts on the adjusting screw, until the engine runs without thump when fully loaded. As wear takes place the large wedges would become loose, but, instead, the small wedge at the right is moved forward by the spring, thereby forcing the large wedge up and carrying the box forward against the wrist-pin. After the small wedge has moved forward its full length, and



SELF-ADJUSTING DEVICE FOR CRANK BOXES AND CONNECTING RODS.

Made by T. W. Broomell, Christiana, Pa.

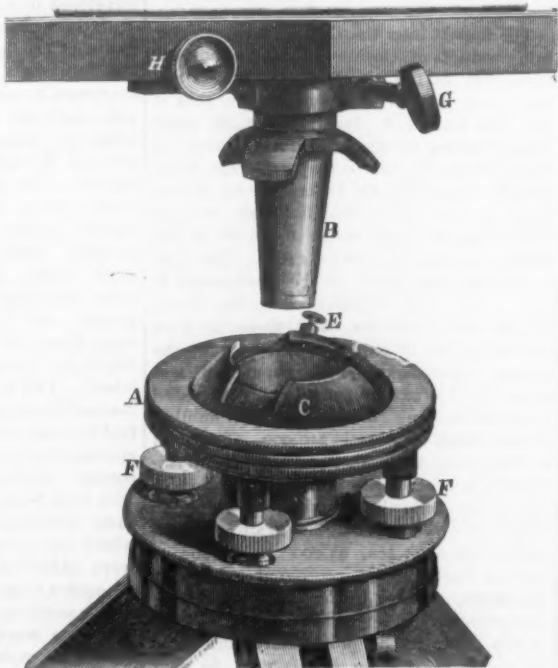
the openings between the boxes are closed by wear, they are planed off, filed in the usual way, and a liner put in.

The device, we are told, works perfectly, being now fitted to several engines, one of them a 12 x 18 inch engine in a rolling mill. When the wedges are properly proportioned it requires only a very light spring to hold them in place.

Steam Packing.

In a long and interesting report on steam packing in locomotives submitted at the last meeting of the American Railway Master Mechanics' Association, we find these replies to one of the questions which had been prepared and sent out by the committee—viz.,

"What is your observation as to the wear of cylinders with cast-iron rings as compared with the old style of brass packing?" Mr. J. Davis Barnett says: "Steam packing did badly bell-mouth the cylinders at each end, and cast-iron rings sprung into place have the same tendency, but in a very mild form, so that this defect is the slightest disadvantage yet experienced with any known style of piston packing. Cylinders will run from 150,000 to 200,000 miles without rebores, but I would recommend a very light cut to be taken at every 100,000 miles, as this practice, while reducing the cylinder friction, will not reduce the thickness of the cylinder shell as much as a heavier cut taken at dates further apart." Mr. J. N. Lauder says: "My observation is that when steam is let under the rings the wear of the cylinder is much greater at the ends than at the center,



IMPROVED WYE LEVEL, MADE BY WILLIAM GARDAM & SON, NEW YORK.

and I try to exclude the steam as much as possible, but steam will go in at the cut to some extent." Mr. Thomas B. Twombly states: "Cylinders wear out much faster with the old brass packing than with the steam packing. In using steam packing we notice that the cylinders are worn away a great deal more rapidly near the ends, but the packing seems to remain tight, and I do not regard this irregularity as a serious disadvantage. I do not think it necessary to rebores cylinders at any regular periods, but when an engine is in for repairs her cylinders should be inspected, and if worn so much that they are no longer capable of rendering good service they should be rebores. We have many cylinders 10 years old which have not yet been rebores. Mr. G. H. Prescott says that with steam packing cylinders wear most at each end and at the bottom. Mr. H. Schlacks reports that in his observations steam packing wears the cylinders more at the ends than in the center, but while he considers this irregularity a disadvantage, experiments have demonstrated that the packing remains tight throughout the entire travel of the piston. Boring depends upon the quality of the metal in the cylinder. Cylinders usually run about 175,000 miles before rebores is found to be necessary. Mr. John Player says: "With our packing the cylinders wear good, and show as even wear from end to end of piston travel. Cylinders need rebores about once in six or seven years, or say after running about 250,000 miles." Mr. A. Griggs states: "I find the spring ring packing to be of great advantage over the old style of brass spring packing—first, because it costs but one-fourth as much; second, because it is automatic, requiring no springs to set it out; third, because it does not require looking at on an average once a year; fourth, when properly fitted up it will run on an average five or six years without renewing, and wear the cylinders comparatively true, showing in that time a difference of not more than 1-16 in. in diameter at the ends and center. Cylinders made of good hard iron will run 10 years without rebores, being counter-bored once during that time." C. C. Hobart states: "The wear with us is very even, a trifle more, perhaps, at the ends than at the center of the cylinder, due more to pressure of steam than other cause." Mr. E. L. Weisgerber says: "There is less wear with the steam than with the spring packing, from the fact that cylinders are not so liable to get out, as the rings are free in the cylin-

Thomas reports: "Where steam packing is used the cylinders wear largest at the ends, more so than by the use of the old-style brass pack with springs. I do not consider this irregularity in the diameter any disadvantage in a packing which is flexible and automatic in its adjustment. Rebores is necessary about once in five years." Mr. G. W. Ettenger says: "Steam packing wears the cylinders less, but not so regularly, as the old-style brass packing." Mr. W. C. Ennis says: "Cylinders wear faster at the ends than with spring packing, but I think with very little, as we do not rebores cylinders oftener than once in three years on an average, and our mileage on a heavily graded road averages 2650 miles per month per engine." Mr. John W. McKenzie says: "Cylinders are worn more at ends, but I do not regard this as a disadvantage with proper lubrication. We rebores about every 100,000 miles." Mr. John McGrayel says: "This style of packing wears a cylinder out of round faster than the old style spring packing or Dunbar, but is much cheaper in first cost and maintenance." Mr. W. H. Stearns says: "Wears most at ends, but gives very little trouble. Cylinders run from eight to ten years." The grade of iron preferred for use in packing rings is very similar in all reports, a preference for a tough, elastic and not too hard metal being expressed; some think the ring should be softer than the cylinder, so that the greatest wear will be upon the ring rather than the cylinder.

The Mossberg Twist Drill Grinder.

Twist drill grinders and grinding attachments are devices of special interest to tool users, and new and improved designs of such machinery are always worthy of attention. We take pleasure, therefore, in showing on this page engravings representing a new apparatus of this kind, put on the market by Mr. Frank Mossberg, of Pawtucket, R. I. The grinder is simple and effective, and is adapted for grinding to a proper angle and suitable clearance any twist drill or straight groove drill, from $\frac{1}{8}$ inch to $1\frac{1}{2}$ inch diameter inclusive. The main portion of the machine shown in Fig. 1 consists simply of an emery wheel stand of ordinary design, fitted with suitable lugs, to which the grinding attachment can be bolted. An enlarged view of this attachment is given in Fig. 2, which will be found to readily explain it. The whole arrangement is swiveled in the small support shown at the right. This is furnished with

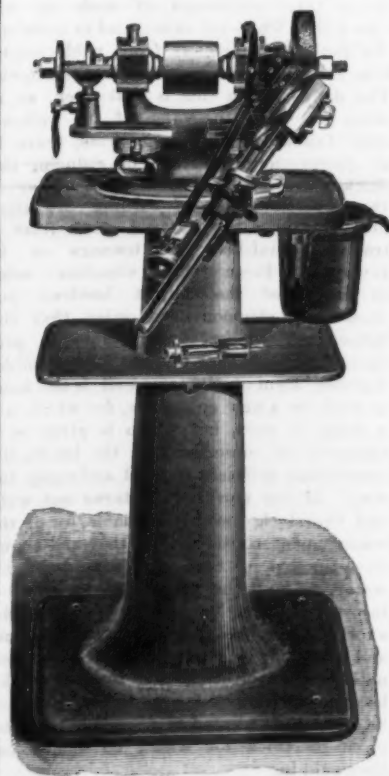


Fig. 1.—General View.

NEW TWIST DRILL GRINDER, MADE BY FRANK MOSSBERG, PAWTUCKET, R. I.

a T-groove on its lower side, and is fixed to the lug on the emery-wheel stand by a clamp screw, more clearly shown at the left in Fig. 1. The support, it will be observed, has a split collar and tightening screw, and the grinding attachment may hence be clamped at any desired horizontal angle. The drill to be ground is placed in V-shaped jaws and clamped by means of a thumb-screw, having previously been adjusted by the gauge B. This adjustment is effected by bringing the movable jaw to bear only loosely against the drill. Then, with the right hand, the spring gauge B is depressed, and with the left hand the drill is revolved until the point of the lip is brought in contact with the point of the gauge. Then the drill is moved straight forward until it engages with the emery-wheel, and is securely clamped. Feed is obtained by turning the graduated thumb-wheel, shown at the left in Fig. 2. This, by means of a screw and sliding block, causes the grooved rod, clearly shown in the engraving, together with the V-shaped drill jaws, gauge B, and other attachments, either to recede from or advance toward the emery wheel on a dovetail slide, the amount of travel either way being read off from the graduated wheel, and shown also approximately by the position of the sliding block mentioned, relative to two gauge marks on the frame in which it moves. The whole attachment is, of course, capable of being moved through a large vertical angle, being pivoted in that part of the device carrying the stop C. This portion is fixed so far as vertical motion is concerned, but can naturally be turned through horizontal angles, mounted, as it is, on the spindle in the split collar to which we have already referred. The pivot for the vertical swing is arranged in a slide which can be raised or lowered by loosening a clamp screw, enabling a ready adjustment of the clearance. The projecting

part C previously mentioned is a short bar pivoted at about its middle point and furnished at its lower end with two notches which can be made to catch and support the attachment in nearly horizontal positions.

In grinding, the drill-shank, as shown in both cuts, has clamped on it a dog, furnished with a lateral projection. This rests on an adjustable stop, which butts up smoothly against the rear end of the drill, and can be moved along and clamped at any desired point on the long grooved rod. When one lip has been ground the drill is revolved through 180° by means of this dog and again clamped, the rear end of the attachment at the same time being elevated sufficiently to prevent the drill from coming in contact with the wheel. For small drills, a special drill holder, A, in Fig. 2, is used. The jaws of this holder are controlled by springs sufficiently strong to hold the work securely. A bevel gauge is furnished with the machine for determining the proper horizontal angle at which to set the device. It will be noticed that the apparatus is so constructed that it can readily be attached to any ordinary small emery grinder, and thus it will in many instances save the expense of buying an extra grinder.

The Vogelsang Propeller.

According to the Army and Navy Register, the Vogelsang propeller is now attracting the attention of navy men by reason of the remarkable accounts received here of its performances in Europe. It is stated that when applied to a German torpedo-boat, without any increase of power, the speed of the boat was increased from 21 knots to over 26 knots. There is trustworthy evidence that it has increased the speed of a number of launches and other small craft as much as 33½ per cent. The invention is about to be tried on one of the North German Lloyd steamers between Bremerhaven and London. It was developed by the inventor at the Washington Navy Yard, and it seems strange that it was never officially reported upon here. Mr. Vogelsang's patent covers the following claims:

1. A propeller consisting of a hub provided with two or more blades or wings grouped upon but one side and unequally distributed about said hub, but in which the distance between the blades is not uniform, and in which no two blades are diametrically opposite, substantially as and for the purpose specified.
2. A propeller having its blades grouped upon one side of the hub or shaft only and in which no two blades are diametrically opposite, and in which the distance between the blades is not uniform, and a non-propulsive counterbalance arranged upon the side of the hub or shaft opposite to that on which the blades are located, substantially as and for the purpose specified.
3. A propeller consisting of a boss or hub provided with two or more blades grouped upon one side only of the said hub, and in which no two blades of the group are arranged diametrically opposite, and a single blade arranged opposite to the group of blades, but in which the distance between the blades is not uniform, substantially as and for the purpose specified.

The inventor says of what he has been able to accomplish: "With propellers in which there are a large number of equally

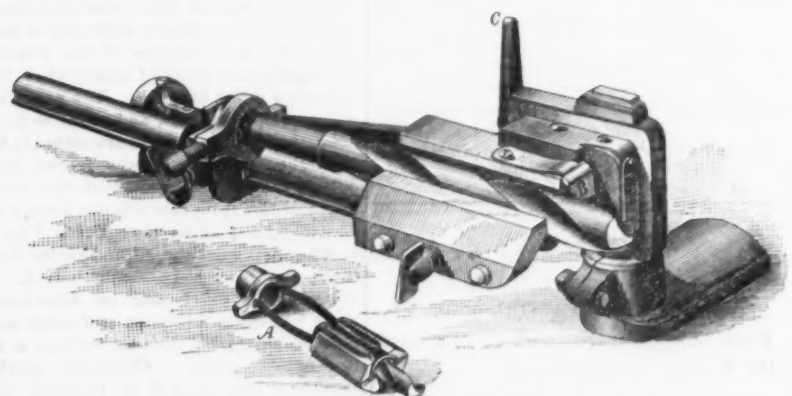


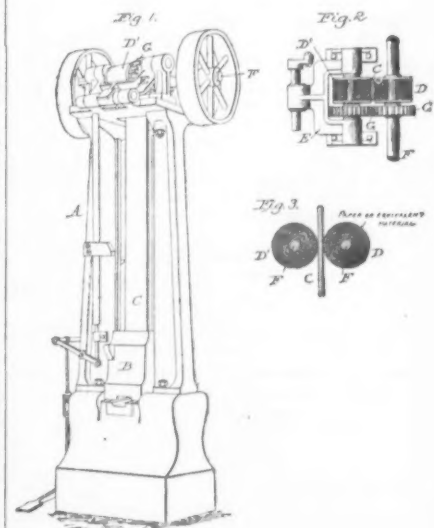
Fig. 2.—Enlarged View of Grinding Attachment.

distributed blades, the water is so greatly churned that it is difficult for the blades to obtain a solid hold in the fluid, and consequently the loss by slippage is very great. By arranging the blades as described, forming a more open space between them, they are enabled to take a firm hold upon the water, and the slip is much reduced, and this reduction is shown in an increase of speed with a given number of revolutions.

Solid Locomotive Pistons.

In the report of the committee on cylinder packing, submitted at the recent meeting of the American Railway Master Mechanics' Association, some interesting particulars are given relative to solid pistons for locomotives. In response to the question, "Do you use solid heads or spider followers and T-rings?" Mr. John S. Cook reports that he uses solid heads with three grooves $\frac{1}{2}$ inch wide, and holds the piston centrally by means of brass bushes placed in the stuffing-boxes, and which are renewed as often as necessary. Mr. James Meehan reports that he uses solid heads, and springs the rings into grooves; he thinks they are preferable to spider-heads and cheaper. Mr. Schlack's reports that some 12 years ago he commenced using solid cast-iron heads $4\frac{1}{2}$ inches thick, the packing rings being sprung over the head into grooves. He has obtained excellent results from it, and prefers it to the spider and follower. First, because there is no danger of the follower bolts working loose, causing the breaking of the cylinder or cylinder head. Second, it is 50 pounds lighter—that is, 140 against 190. Third, it can be fitted up at one-half the expense of the spider and follower, and is less expensive to maintain when it is well designed and cored out, and the walls properly secured by stay bolts tapped through the head; there is no danger of its falling while on

the road, as in our entire experience we have not had one give out. On account of the gases which appear to collect in the cavity made by the core we have found it necessary to drill a $\frac{1}{8}$ in. vent hole through the wall on one side of the head. Mr. E. L. Weisgerber states that for the past five years he has been using a solid cast iron head because it can be fitted up for one-half the cost of spider and follower head and there is no liability of the follower bolts working out and causing the breakage of cylinder heads and cylinders. Mr. J. Davis

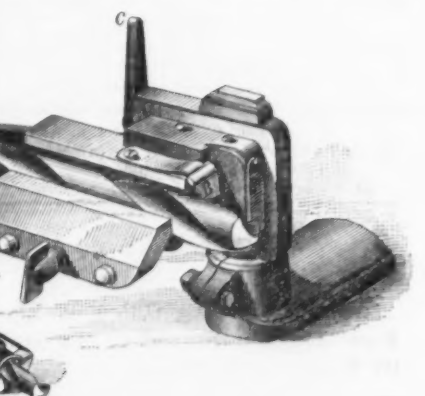


An Improved Drop Press, Built by Williams, White & Co., Moline, Ill.

Barnett says: "we use solid heads and spring the rings over into grooves: would recommend a solid piston head—that is, a head cast completely in one piece, and if properly designed and cored out it can be made as light in weight as a spider head and at one-quarter its cost; there is less risk of failure in a solid head when it is out on the road at its work, and, being cheaper to renew, there is less reluctance felt when the head is worn in throwing it away and putting a new one in."

An Improved Drop Press.

Messrs. Williams, White & Co., of Moline, Ill., are building an improved form of drop press, which we illustrate in the annexed engravings. The usual plan for friction drops has been to use iron rollers, taking hold of a board attached to the hammer. The pressure necessary to hold the board sufficiently to lift heavy hammers soon proves destructive to the wood, and it splinters and must be replaced. To overcome this a good quality of paper is used for the rollers in the press illustrated, and it has been found that the adhesion thus secured is better than that of iron to wood. The rollers DD may be made up in various ways—that is to say, they may be composed of a series of disks clamped between metallic end plates, as shown in Fig. 2, or they



may be made by winding the paper about the roller shaft until a roll of the required size is built up, as shown in Fig. 3. Instead of either of these plans, the roller may be made of paper maché compressed in a hydraulic press to the desired size and form. The strap C, Fig. 1, is made of steel, though the ordinary wooden hammer strap may be used with good results.

Heavy Gun Trials on Board Ships.

—English papers give particulars of recent practice with the 45-ton guns of the British war-ship Colossus, carried out off Malta. The object was to ascertain the rapidity with which accurate fire could be delivered, the ship being in motion. For the first time in the history of naval gunnery this was tried with heavy breech-loading guns worked entirely by hydraulic power. Great importance was, therefore, attached to the practice. The ship ran at a speed of eight knots per hour along a measured base distant at the extremes rather over 1000 yards from the target. The results are said to have been highly satisfactory. The heaviest charge of powder was used throughout, and all the machinery is reported to have stood the test admirably. Several times a gun was fired, loaded again, pointed, and fired a second time in 1½ minutes, and four charges of the same gun were completed in six minutes. Every shot struck the target, and out of one series of four very rapid shots, no fewer than three struck it.

A strike of natural gas was reported on the 27th ult. from Auburn, DeKalb County, Ind. The fluid was struck at a depth of 500 feet, and, when lighted, blazed to a considerable height. Drilling was resumed, as it is believed that Trenton rock has not yet been reached.

The Iron Age

AND METALLURGICAL REVIEW.

New York, Thursday, July 7, 1887.

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The Chicago Office of The Iron Age is removed to 95 and 97 Washington Street.

The Position of the Iron and Steel Trades.

Developments during the current month will be all-powerful in shaping the course of trade in many lines in iron and steel for the second half of the year. Late in April we had occasion to point out that there was a tendency toward lower figures in all lines not directly connected with railroad construction. We have not had occasion to record a single advance in May, while in June stiffening in a few directions has been more than counterbalanced by a decline in other specialties. The turning point has been reached in a few articles, and it will be soon evident whether higher values will generally prevail. For nearly four months—March, April, May and June—the trade has been, generally speaking, quiet, and under a tremendous pressure prices have slowly receded. Yet, taking into account how enormous has been the output, it will be conceded that the markets have borne up wonderfully well, with buyers steadily holding off to the last moment. We have advocated that policy when last we wrote, but we believe that the time is fast approaching when a change is called for. The experience in the past has shown that usually a buying movement sets in toward the end of July or early in August. Prior purchases are generally exhausted by that time, since few care to add to their engagements just before closing down for repairs and before taking stock. This year there was a rush of buying in December, January and February, followed by four months of conservative action. It is not unreasonable to suppose that the contracts then made must be drawing to an end rapidly. During that period trade was undoubtedly seriously disturbed by the Interstate Commerce law. Business has now be-

come adjusted to whatever changes it has wrought—changes which we now know to have been far less important than they were generally expected to be. The effort of the railroads to use its enactment as a pretext to heavily advance rates has only been moderately successful, and yet their profits have been very much greater than last year, and are now again close to their normal average. Making due allowance for the many devices resorted to to make their revenues appear heavy enough to warrant bull speculation in stocks, enough remains to prove that the railroads are again prosperous. The large lines, notably in the West and South, have launched into new enterprises which have given full employment to our rail mills, bridge shops, locomotive and car works, and renewals have been going on at a liberal rate. As usual, the demand for rails has been far in advance of that of other parts of the equipment, and that gives strength to the belief that many heavy orders for locomotives and cars are still to come. In fact, that movement has already begun. Consumption in other directions is enormous, the agricultural interests being fairly prosperous, while building throughout the country is very heavy, the tendency toward speculation in unimproved property giving way lately to investment in construction. Wages are relatively high, and the purchasing power of the great masses is undoubtedly larger than it has been for many years. It is generally conceded, with the evidences of it on every hand, that the current and prospective demand for iron in nearly all its forms is larger than it ever was before.

The question, so far as the future is concerned, hinges upon the point whether the output is likely to be in excess of requirements or not. Turning first to pig iron, it may be stated at once that the restriction of output brought about by the coke strike in the West has had the effect of checking what threatened to become a serious decline, and we now enter the second half of the year with stocks certainly lower than they were known to be for years. Already the signs are gathering of a hardening tendency there, and the majority of the Southern furnaces, the bugbear of the trade, have filled their order books up to capacity, which has been quite generally overestimated. Whatever may be the influence later in the year, and early in 1888, of the new plants approaching completion, they are not destined to play an important part during the next quarter. In the East the best foundry grades are growing scarcer and only mill iron and off grades persist in weakness. Rails and structural material are provided for for the next four months, and the works are pretty sure to pick up enough business to keep them running quite full up to the opening of 1888. In bars, plates and wire the situation is less well defined, although the outlook there, too, has its reassuring features. In nails of all kinds the future is not promising. In old material, which has so long suffered from forced sales, it has been shown lately that any demand for consumption causes a stiffening of prices. In all but a few branches of the iron trade any buying movement of magnitude is likely to cause a rising tendency. The next month will develop this point, and so far as present indications go the chances are rather in favor of higher figures. It was feared widely during the past two months that without heavy orders from this side the foreign markets would display much weakness. Very little new business went abroad, and yet the decline there has been very small indeed. Any indication of purchasing on American account has led to a prompt stiffening, as has been shown during the past week in a number of specialties. Generally speaking, therefore, the outlook is decidedly favorable, although slight disturbances only may turn the scale in the direction of lower prices.

The veteran, Hon. W. D. Kelley, is doing the South good service through a series of interesting letters which he is contributing to the columns of the *Manufacturers' Record*. He is showing his earnest desire to foster its best interests, not alone by speaking enthusiastically of its resources and its enterprise, but also by fearlessly exposing sharp practices which have hurt it and are bound to injure more unless suppressed. In a recent communication, in which he discusses South Pittsburgh, Tenn., he says: "The 'City Pamphlets,' with its '11 full page illustrations, 21 pages of descriptive matter,' and 'exquisitely engraved cover,' which had been prodigally distributed, could not be accepted by settlers as an offset to this and other deficiencies, such as the total want of schools, street lamps and fire apparatus. Indeed, this proposed substitute for the means of common school instruction, dwelling-houses, light and protection from conflagration was much derided in my hearing, as it included engravings of buildings which were yet invisible, and allusions to such imaginary places as a 'cottage bedecked hillside,' &c. But, as I learned from parties who had come a great distance for the purpose of effecting a settlement in a milder climate than that in which they now live, its exaggerations filled strangers with doubt and drove some of them away in disgust." We have heard of a number of cases of disgraceful sharp practices and of stupid "booming," and, while we know that they are exceptional, it is certain that they do harm out of all proportion to their numbers or significance. Southern business men will do well to thoroughly discountenance such methods.

Railway Stock Watering and Rates.

Interdependence may be traced in the world of political economy, and especially in the different parts of that great question known as the railroad problem. Thus the short haul involves a discussion of stock-watering. In our remarks upon the long and short haul clause of the Interstate law, we said that in the competition between rail and water lines, the physical ability of the railroad to reduce the interior rates to the level of the water tariffs should be carefully considered. Upon this point the commissioners in the recent manifesto, say: "Every railroad company ought, when it is practicable, to so arrange its tariffs that the burden upon freights shall be proportional on all portions of its line, and, with a view to revenue sufficient to meet all the items of current expense, including the cost of keeping up the road, buildings and equipment, and of returning a fair profit to owners. But it is obvious that in some cases, when there is water competition at leading points, it may be impossible to make some portion of the traffic pay its equal proportion of the whole cost. If it can then be made to pay anything toward the cost above what the taking of it would add to the expense, the railroad ought not in general to be forced to reject it, since the surplus, under such circumstances would be profit." This in carefully guarded language means that even water competition is no excuse for making through rates lower than local, unless the higher local rates can be proved necessary for actual expenses and a fair profit. A fair profit upon what? Should watered stock be included as fair capital?

The most common form of stock watering is where the additional stock is issued to represent more nearly the real value of the road and franchise at the time of the issue, which may have largely increased since the organization. Thus, practically such issue represents the increased earning capacity of the road and the increased dividends which its directors assume it can hereafter pay. In this respect, such a railroad is a creature of its time. Rapid fluctuations, as compared with the steadiness of Europe, is the feature of many of our American investments. It is to take advantage of such an advance from whatever cause, and to cover up the increased dividends from public attention, that the water is poured into the stock. The danger from this is that when, as is often the case, the value of the railroad may fall as rapidly as it arose, there is no corresponding method of reducing the stock. Then is put before the managers the impossible task of earning the usual dividend upon the watered stock from a traffic diminishing in tonnage or in revenue. From this situation arise so many of the unjust burdens put upon local shipments, in order that the latter may support the dividends previously paid and now thought indispensable. Another form of the same evil is the issue of stock by a new enterprise, for which not a dollar is paid, but which is given as a bonus to all subscribers to the bonds, the latter being sufficient to build and equip the road. If the new railway turns out well, and the stock becomes valuable, or if the management consider that they are bound from the first to earn dividends upon this water, we have the same result as before—injustice to the helpless by reason of the exorbitant profits demanded by the directors and officials. It is clear that such discriminations between local and through traffic, because of competition at the termini, will be no longer accepted as necessary to a fair profit on stock for which no money has been paid in.

For such stock watering the public is itself somewhat to blame. It was made necessary because public opinion had adopted the crude notion that high dividends in some way meant a wrong to shippers. This is far from the truth: there is no necessary connection in railroading between large profits and high rates. By reason of exceptional advantages a railroad may enjoy a large traffic at low rates which may return a good revenue, while another road may charge exorbitant prices on smaller business and not even pay the interest on its bonds. The shares of the New York Chemical Bank are quoted at \$2500 each, yet no one claims that more than the usual interest has ever been exacted or indeed could have been. In somewhat the same way we may say that fare and reasonable rates may be charged by a railroad earning 10 per cent. or more. Practically it is when earnings fall below the average, whether on real or watered stock, that the temptation becomes strongest to oppress the non-competitive points.

Taking this view, what suggestions can be made? First: public sentiment should allow of unusual dividends when there are no proofs of unreasonable charges. Such large earnings will always regulate themselves. This being supposed, we should, secondly, prohibit the issue of new stock without payment therefor, except under unusual circumstances, to be decided by some competent tribunal. With public opinion changed, sentimental reasons for this stock watering will thus pass away. There are other forms of stock watering, such as appear in the history of the Erie Railway, which are really commercial crimes, and which should certainly come under the general prohibition. All these questions are really involved in the Interstate Commerce law and in the rulings which the commissioners will be called upon

from time to time to make. As we have said, this question of stock watering must be one of the factors in interpreting the short haul clause, and also the matter of cost of service in cases where higher freights are put by the railroads upon the interior towns. If this is done to save the dividends heretofore paid upon watered capital, it should not be allowed, even though such water represented at one time the increased value of the road. But here again we need that public sentiment should allow more than 3 or 4 per cent. to be paid by any prosperous railway where no oppression is claimed without protest. We thus keep the balance and permit the fluctuations of traffic and values to take place naturally.

Our Trade with Ceylon.

The import into the United States of certain products of Ceylon during the current fiscal year of the island, commencing October 1, has increased at such a rate that it may not be out of place to enter into some details having reference to developments in that British Indian colony. Ceylon is an island situated in the Indian Ocean, off the southern extremity of Hindostan; its extreme length from north to south is 266 miles, its greatest width 140½. The first settlement was made by the Portuguese in 1505, who were dispossessed by the Dutch in the next century, and these in turn ejected by the British in 1795-1796. By the census taken in 1881, the population was ascertained to be 2,763,984, having increased 15 per cent. since 1871. The total number of plantation laborers is 210,000. The area of the colony is 24,702 square miles, or 16,233,600 acres, on the cultivated portion of which the following products are raised: Rice on 605,000 acres; other grain, 109,000; coffee, 132,000; tea, 93,000; chinchona or quinine bark, 44,000; coconuts, 456,000; cinnamon, 35,000; tobacco, 10,000; areka, palmyrah and other palms, 100,000; cocoa, 12,500. The public indebtedness amounted in December, 1884, to £2,103,724. In 1875 the revenue was £1,354,123; in 1884, £1,162,721; the expenditure amounted to £1,220,180 in 1875; in 1884 to £1,154,832.

The telephone has been introduced in Colombo and the principal towns, are connected by telegraph, there being 1150 miles of line in operation. The telegraphs of Ceylon are connected with the Indian system. There are in operation 1300 miles of railway; graveled roads, 885 miles; natural roads, 622, and canals, 167. In 1884 there was expended on public works, not including railroads, the sum of 1,979,687 rupees. Four different ocean steamship lines keep up communication with India, Europe, the United States via Suez, and Australia.

The trade of the island is as follows:

	Import of Merchandise.	Export.
1875.....	\$5,361,340	\$5,375,410
1884.....	4,811,451	3,161,302

The export declined in consequence of the leaf disease in the coffee plant, and the comparatively small quantity shipped brought a low price. Planters consequently introduced chinchona culture from Peru, which proved a great success, tea from India, which has also done remarkably well, and quite a variety of other products, such as cocoa, &c. Now that coffee has risen so much in value and the leaf disease has abated considerably, there may be a serious return to that staple, the more so as chinchona culture is being overdone. The chief source of mineral wealth is plumbago, which fluctuates in output as the demand may chance to be and the price it brings in England and America.

From October 1 to April 14 coffee exportation declined from 220,772 cwt. in 1883-84 to 113,869 in 1886-87; chinchona rose from 3,509,690 pounds to 8,080,450; tea, from 665,669 pounds to 4,397,339; cocoa, from 6093 cwt. to 13,007; coconut oil declined from 211,383 cwt. to 156,679; plumbago, from 128,841 cwt. to 115,282; coir rope, from 8797 cwt. to 4347; coir yarn, from 51,002 to 38,270 cwt., while fiber yarn rose from 6739 cwt. to 9146. Citronella oil, an article chiefly consumed in the United States, increased from 2,385,049 ounces to 4,695,168. The shipments to the United States from October 1, 1886, to April 14, 1887, were chiefly composed of the ensuing articles as compared with the shipments to England: Chinchona, 404,087 pounds, against 7,192,713 to England; tea, 6425 pounds to the United States and, 4,246,235 to England; cocoa, 534 cwt. and 11,571 respectively; coconut oil, 62,031 and 52,152 respectively; plumbago, 77,078 cwt. and 36,123; citronella oil, 3,094,648 and 1,592,600 ounces, and cinnamon oil, 9730 and 28,552. The articles of which the United States took so far this year unusually large amounts were consequently coconut oil, for soap manufacture, plumbago, and among essential oils citronella.

Owing to the magnificent geographical position of the island the maritime movement is very large; thus, in 1887 the inward tonnage amounted to 1,758,445, and the outward to 1,752,121. A steady increase has manifested itself since the effect of the large breakwater at Colombo has been felt. It was commenced in 1875 and is now finished, the total cost having been £650,000. Products are so varied in Ceylon because there are 4000 square miles in the Central part forming a mountain zone at an altitude of 1500 to 6000 feet above the sea level. Along the coast the annual mean temperature is 80° F.; 6000 feet above the level of the sea it is 32°. Ceylon is without a doubt in every

respect one of the finest and most promising British colonies within the tropics. Soil, climate, abundant labor, position, and good local administration all combine to render it valuable. To America it is especially important on account of its never-failing plumbago supply.

The Revelations of a Broken Wheat Corner.

For a period covering almost the first half of this year an attempt was made to corner the Chicago wheat market. The source of the orders directing the movement was for a time closely concealed, although at length they were found to emanate from Cincinnati, but they were so ingeniously conveyed that the managers for a long time continued enveloped in mystery. The Chicago representatives of the deal seemed equally mystified with the general public, but as long as the "sinews of war" were forthcoming they continued to act for their unknown principals, and the corner grew in proportions until the magnitude of its operations impressed old habitués of the Chicago wheat market with the feeling that a powerful combination of capitalists, controlling untold millions, was at the bottom of this gigantic deal. The Standard Oil Company were hinted at, and numerous other aggregations of moneyed men were pointed out by the gossips of the Chicago Board of Trade as manipulating this Napoleonic campaign against the sellers of wheat. For it was in many respects a most masterful campaign, indicating complete control by some person or persons of the various circumstances governing the progress of a corner. Every attempt was made by those who were being driven to the wall to secure their deliverance from the merciless force which was crushing them. Other markets were called on for large supplies of wheat to enable them to fill their contracts, but such quantities as were available were for a long time absorbed in the interests of the corner as rapidly as they reached Chicago. Devices of all kinds, known only to the practiced manipulators of the Board of Trade, were tried time and again in the hope that they would succeed in breaking the corner, but they were met and baffled as often as tried.

At length the Chicago elevators were all full to bursting, and warehouses of all sorts throughout the city that had been pressed into service were also filled, and the operators of the corner controlled their entire contents. They then believed that they had the sellers of wheat for future delivery at their mercy, and could put the price up to a figure which would pay them a most excellent profit. But the people of Chicago were plucky, and did not give up the fight. They proceeded to build more elevators. One with a capacity of 500,000 bushels was built in 14 days, an unprecedented feat. They called upon outside markets for increased quantities of wheat, for which storage arrangements were made of a character unanticipated by the manipulators of the corner. At last the in-rolling tide of grain became too great for the endurance of the speculators for a rise, and on the 14th of June they were obliged to succumb to the pressure, causing a panic of proportions surpassing any similar experience on the Chicago Board of Trade. This disaster made the revelation of the principal speculator inevitable, and when he was exhibited to the gaze of the world it was found to be none other than E. L. Harper, of Cincinnati, pig iron broker, iron manufacturer, and recently vice-president of the Fidelity National Bank, of Cincinnati.

It was not the Standard Oil Company, nor a combination of veteran speculators of the Board of Trade whose sharp wits outweighed cash, nor yet an aggregation of millionaires with wealth enough to control the trade of a continent, but it was a single individual of necessarily limited means, who had for all these months faced the shrewdest speculators of the greatest grain market in the world, and had almost succeeded in carrying out the most colossal corner ever attempted. Such a man has a history usually, but the history of E. L. Harper is somewhat brief. About 10 years ago he occupied a clerical position in a Cincinnati iron house, then started in business for himself when a favorable opportunity had been presented by the dissolution of the old house, and in the boom of 1870-80 he launched his bark on the sea of speculation and made large sums of money in the great rise in pig iron. From that time he has been a prominent figure in the Cincinnati iron trade. He became interested in Swift's Iron and Steel Works, the Riverside Rolling Mill and blast furnaces in the Hocking Valley. Business men of all degrees of prominence courted his favor, and his advice was sought in matters of moment. Occasionally he dabbled in outside speculations, sometimes with success and occasionally meeting with losses, although very few ever knew of the latter. He helped to organize the Fidelity National Bank, became one of its executive officers, and straightway that bank became one of the most prominent and promising financial institutions of Ohio. And yet he is not an old man—in fact, only about 43 years of age.

Now that he has fallen, crushed by the mighty load of debt he has piled up, with all his friends ruined who had trusted in him, with the strong arm of the United States holding him in duress for violation of the national banking laws, and with practices

charged against him that show an utter lack of principle, he finds "none so poor to do him reverence." Only yesterday he was a king among speculators; to day he is bereft of everything—even of a good name.

The efforts of the Knights of Labor to discourage strikes and in every way to promote a better feeling between labor and capital are not well received by the old time labor leaders, and serious divisions are springing up between the various labor organizations in consequence. A recent development in this direction concerns the bituminous coal miners of the West. The Executive Board of the National Federation of Miners has issued an address setting forth the failure of the miners of Southern Illinois to demand regular scale prices, in consequence of which the miners of other districts are unable to secure a conditional advance which had been promised them. The federation of miners alleges that this non-action of the Southern Illinois miners is due to the influence of the Knights of Labor, whose chief aim and object, it is charged, seems to be that of antagonizing and defeating the federation in all its undertakings. The Knights of Labor are therefore bitterly attacked, the motto of their order declared to be "a flaunting lie," the organization to be "rotten from center to circumference," and much more to the same purpose. The object of the circular evidently is to drive the miners to the support of the federation, and leave the organization of the Knights of Labor. As a quarrel between two labor organizations it would possess very little public interest, were it not for the fact that it points to another influence at work in the direction of disintegrating the great labor order, which at one time threatened to overpower all opposing interests, and even dictate terms from the centers of political authority.

Sheffield as a Pig Iron Center.

A correspondent sends us the following: The location of this town on the South Bank of the Tennessee River and on the line of the Memphis and Charleston Railroad is too well known by the readers of *The Iron Age* to need a detailed description. There are five blast furnaces under construction at the present time at this place, and some account of these may prove interesting. First and most advanced is the furnace by the Sheffield Iron Company, the draft stack, main stack and stoves, of which there are three, being completed, as is also the casting house. Nothing remains now to do but to finish the hoisting apparatus, some roofs, tracks, &c. The size of this furnace is 17 x 75 feet, the stoves are 18 x 50 feet, and the two blowing engines are 48 x 84 inches.

Another furnace plant is that of the Lady Enslay Company. Of this the foundations are nearly completed. Much of the machinery and all the firebrick are on the ground. This stack is to be 17 x 75 feet, with 3 Whitwell stoves, 18 x 25 feet. The whole is under contract with Mr. J. P. Witherow. The firebrick used in this furnace and stoves is half Laclede and half Sciota.

The company that is building the other three furnaces is the Alabama and Tennessee Coal and Iron Company. These stacks are located in one line, and the pipes, &c., are so connected as to be available to any one of the stacks. Their dimensions are 18 x 75 feet, or the three stoves for each furnace 20 x 65 feet. They are what is known as the Whitwell-Cowper-Gordon design. The foundations are mostly in, and much of the machinery and ironwork are on the ground. They will be blown by seven engines, 48 x 84 inches, and will be so connected as to be available for any one of them. The brick used in these furnaces and ovens is Sciota and Standard, and all is under contract with Gordon, Strobel & Laureau, with specified time when each shall be completed ready for blast. The Lady Enslay and the Alabama and Tennessee Coal and Iron Company's furnaces are under the direct supervision of Mr. Edward Doud, who formerly built the Chattanooga and Cowan furnaces, and later the Citico Furnace of Chattanooga.

The location of the five furnaces is just west of the town proper, although within the corporate limits, on a bluff, or rather plateau, about 100 feet above low water of the river. Each furnace has 20 acres donated to it by the Sheffield Land Company, and all are so located that tracks are run around them on all sides. Another admirable feature of the location is a ravine about 75 feet in depth immediately in their rear, for the disposal of cinder, &c. The last four furnaces expect to be in blast some time during the middle or latter part of 1888, and, as the parties who are at the head of the enterprises are men of large means, it can only be presumed that they will be pushed to early completion.

The question of the policy of the construction of such large furnace capacity must seem to many to be decidedly premature, in the absence of a well-secured coke supply, but their projectors seem to have taken that question fully into consideration. The Sheffield and Birmingham Railroad have now 51 miles of their line just completed, the last 11 miles of which enter the Warrior coal fields. Thirty-five miles further connects them with Birmingham, on which they are at work and are pushing as fast as possible. The next four months will see this connection made. The last 35 miles run entirely through the Warrior coal fields. At the nearest available point on this line the Tennessee and Alabama Coal and Iron Company have commenced developing the coal and also begun the construction of 1000 coke ovens, which, as soon as completed will be followed by the construction of 1000 more, until 3000 ovens are under operation. The construction of these ovens will dispose of the question of coke.

It has been urged by many that but little ore existed on the line of the S. and B. Road, but recent investigations have proved this to be incorrect. Some large deposits have been developed within about 25 miles of

Sheffield. In addition to this the well-known deposits of Brown ores of Middle and West Tennessee commence at a point about 23 miles north of Sheffield. Through that district the Louisville and Nashville Railroad are pushing their line as fast as possible and will have their line in connection with Sheffield within the next three or four months. Of the quality and quantity of these Tennessee ores there can be little question. Concerning their quality, the history of Tennessee iron making for the last 50 years fully establishes their character. Sheffield is situated on a limestone plateau about 100 feet above the river. Along the entire river bank is a limestone bluff about 75 feet thick, which will afford ample facilities for getting all the lime required.

A few words may not be out of place in reference to the facilities that these furnaces will have for getting their pig to market. All of them are located within 150 feet of low water of the river, and most of them have already trams running to the water's edge for the purpose of getting their machinery, &c., much of which is coming by water. A barge line has already been formed for the purpose of transporting the iron to any of the points on the Mississippi River and its tributaries. Those controlling it have already expressed their opinion that they will contract to lay the iron down from Sheffield at any of the points of consumption that can be reached by river at prices ranging from 50 cents to \$1 per ton. At any rate, water transportation is there, and neither Congress nor any set of individuals can get up a corner on river transportation.

Commodore Sicard on the New Steel Guns.

(From our Washington Correspondent.)

At Meridian to-morrow (July 6) the usual proposals invited from domestic manufacturers of steel for ten sets of steel forgings for 6 inch breech-loading rifle guns, and one set of chase hoops for a 10 inch breech loading rifle gun will be opened. The estimated total quantity of steel required is 65 tons. Commodore Sicard, chief of the Bureau of Ordnance, Navy Department, speaking on the subject of the new guns, said to-day:

"The results on the 6 inch breech-loading guns have been so satisfactory that we are anticipating very gratifying results on those of 10-inch caliber. Three are now under way. One will be ready very soon. We will then be able to secure the results of actual tests. Our figures now are computations based on the achievements of the 6-inch guns."

"What are the results of the two calibers?"

"A 6-inch gun weighs about 11,000 pounds. The cartridge is 50 pounds of powder, and the shell weighs 100 pounds. With a muzzle velocity of 2000 feet it will penetrate 12½ inches of wrought iron, and at 1000 yards 10½ inches, and at 2000 yards 9 inches. The 10-inch guns weigh 26 tons, or about 55,000 pounds. They will throw a 500-pound shell with a 250-pound cartridge 9 miles. With 2000 feet velocity at the muzzle it will penetrate 22 inches of wrought iron, at 1000 yards 20 inches, and at 2000 yards 18½ inches. We think our high-power guns will surpass anything now produced abroad. These forgings are independent of the Bethlehem contract, and will be wanted at once. Although there will be some shifting of machinery, the new naval arsenal at the Washington Navy Yard can turn out all the work on guns that we require."

"There are also proposals for steel cast guns for the navy?"

"The last Congress made an appropriation for the purchase and completion of three steel-cast, rough bored and turned 6-inch high-power rifle cannon of domestic manufacture, one of which shall be of Bessemer steel, one of open-hearth steel and one of crucible steel. These will be opened early in August. We will require them to be capable of safely discharging projectiles weighing 100 pounds each, with a muzzle velocity of not less than 2000 feet per second. This should afford an opportunity to test the qualities of cast steel as material for high-power guns. We have no opinions on the relative value of the different materials. We are anxious to see what guns of such material can do, and if any one will contract to make them we will give them a proper test, and will then have some authoritative data. Great strides are being constantly made in the manufacture of gun material and improvements may be expected in guns. We are in the advance now as a nation, and will keep there if the liberality of Congress continues."

THE PROPOSED BATTLE SHIPS.

The Secretary of the Navy has not yet determined the question of the selection of the model for the proposed line of battle ship. The Barrow plan has been recommended by the board, and may be indorsed by the Secretary. The law requires that one of these 6000-ton ships shall be built in one of the Navy Yards. The Brooklyn yard has already been practically settled upon as far as location is concerned. As soon as the plan of the vessel is determined work can commence. It is said in naval circles that it will require between five and six years to construct one of these great floating forts. This is estimated upon the length of time required to build one in England or France, where they have the plant ready to do the work.

WIRE RODS.

Assistant Secretary Maynard, who heard arguments last week against the present classification of the smaller sizes of wire rods, has been absent from the city, and therefore has not yet looked into the arguments pro and con. It is intimated that it will be some days before a decision can be reached.

STEEL INSPECTIONS.

A dispatch received at the office of the Chief Inspector of Steel reports the result of a preliminary informal test of the stern-post of the cruiser building at San Francisco, cast by the Pacific Rolling Mills, as showing a tensile strength of 65,000 pounds, the mini-

mum required being 60,000, and an elongation of 21 per cent., 15 per cent. being the requirements for castings.

THE CORPS OF INSPECTORS.

The corps of officers detailed to conduct these inspections is composed of the following and their stations:

Washington.—Office of the Chief Inspector, Commander Robley D. Evans, assisted by Lieut. F. J. Milligan.

Pittsburgh.—Lieut. Commander H. E. Nichols, Park Brothers; Lieutenants J. A. Rodgers and Essign K. Kimmell, Linden Steel Works; Lieut. F. W. Coffin, Union Iron Works.

Allegheny.—Lieuts. W. C. Cowles, H. H. Hasley, W. B. Caperton and J. T. Newton, Carnegie, Phipps & Co.

Seniokley, Pa.—Ensign J. H. Rohrbacher, Park Brothers.

Phoenixville, Pa.—Lieut. J. H. C. Coffin, Ensigns P. V. Laddale and H. Rigby, Phoenix Iron Company.

Chester, Pa.—Lieut. M. F. Wright, Chester Rolling Mills.

Nictown, Pa.—Lieut. R. Galt, Midvale Steel Works.

San Francisco.—Lieuts. F. P. Gilmore and R. J. Dorn, Pacific Rolling Mills.

Paris, France.—Lieut. B. H. Buckingham, works of Krupp, Germany; Whitworth, England.

LIVELY TIMES EXPECTED IN THE NEXT CONGRESS.

The most lively tilt ever witnessed in the House of Representatives may be expected upon the organization of that body upon its assembling in October or December. It has just leaked out that the leading spirits of the free trade hostility to Randall and his conservative friends on tariff matters have been putting their heads together to revise some plan by which his importance in the business of the House may be reduced to a minimum. In the last congress they succeeded in accomplishing the first step in that direction, by so amending the rules as to take from his committee seven of the regular appropriation bills and assigning them to other committees. They now propose to secure from Speaker Carlisle a promise or a hint, that in the event of his re-election he will relegate Mr. Randall to the floor and will not place him at the head of appropriations.

This scheme coming to the ears of Mr. Randall, he smiled with his usual complaisance quietly remarking: "Well, let them try it." There is no question that Mr. Randall has the whip-hand of his party on questions of organization or tariff. The margin of difference between the two parties on a full vote is but 15, a change of eight being sufficient to transfer the majority to the other side. Conceding the support of Carlisle for re-election by Mr. Randall's friends, should he undertake to displace himself from the Committee on Appropriations, that gentleman and his followers, who number not less than thirty, on such an issue would retaliate by a motion to elect the Committee on Appropriations and Ways and Means. The House has that power, and the friends of Mr. Randall declare that they will exercise it if any attempt should be made to practice any high-handed proceedings upon them. It is very evident that the relations between these two wings of the party are far from reconciled, and some exciting scenes may be looked for when these elements come in contact with each other in the organization and proceedings of the next House.

On Wednesday, the 6th inst., a convention of plow manufacturers was held at the Palmer House, Chicago. It was composed of the plow manufacturers of the North west, and important business was transacted, of which no particulars have been received up to the hour of going to press.

A dispatch from Fort Scott, Ark., dated June 28, says that there is great enthusiasm at that place over the discovery of gas in a well sunk by the Fort Scott Economy Gas and Fuel Company in quantities far in excess of any well opened in that vicinity. This makes the twelfth well now flowing within a mile and a half of the heart of the city, completely settling the question as to the quantity of gas.

The entire business center of Marshfield, Wis., was destroyed by fire on the 27th ult., caused by a spark from a locomotive. The loss is not less than \$4,000,000. But one store and a few half burned houses are reported to remain of this once flourishing town. On the 28th, about half the business portion of Hurley, in the Gogebic mining district, in the same State, was burned, the loss being estimated at \$80,000.

J. F. Frost, Jr., has been appointed treasurer of the Wilmington and Weldon, Wilmington and Columbia and Augusta Central of S. C. and Albemarle and Raleigh railroad companies, in place of J. W. Thompson, resigned.

Mr. J. P. Clark, of the Tamarack and Osceola Mines, and connected with other Lake Superior enterprises, will build a copper rolling mill at Dollar Bay, Mich., where a town is being laid out, a wharf built and other improvements made.

Some interest was excited in Chicago last week over a report that the great Jumbo gas well, at Fairmount, Ind., had been sold to Buffalo parties who intended to pipe gas thence to Chicago. The purchasers denied the rumor when it reached them a day or two subsequently, stating that the well would be used for local purposes, hinting, however, at a contemplated removal of manufacturing from Eastern points to Fairmount to enjoy the use of the cheap fuel. The former owners of the Jumbo well are now driving another well to supply the town. Should they fail to strike gas in well No. 2, they will be in an interesting condition, as they have made contracts for a year and buildings are piped for gas.

The Joliet Steel Company have declared a dividend of \$6 per share.

The New Mileage of the First Six Months.

The *Railway Age*, whose statistics are generally accepted as the most reliable, has gathered figures which show that during the past six months tracklaying has been going on in 37 of the 47 States and Territories, on 136 lines, with the result of adding 3754 miles of main line track to our railway system. This is a far larger showing of new construction than that for the corresponding period in any previous year excepting 1882, when nearly 5000 miles were laid down in the first six months, and 11,563 in the year. The nearest approach to this was in 1881, when about 2500 miles were reported in the first six months out of 9796 for the year. But in 1886 the returns gave for the first half only 1755 miles, while the work of the year, according to our corrected record, was about 8500 miles.

While it is not safe to base estimates of the total year's work very closely on the record for the first six months, because in some years the work opens much earlier and continues much later than in others, and various other unforeseen conditions affect the result, yet from a study of the field we still feel safe in predicting that the total new mileage laid down in 1887 will not be less than 10,000 miles, with the likelihood of considerably exceeding that, and perhaps surpassing the record of the year of greatest railway construction in the history of the country, 1882. Of the 136 lines—not companies—covered by the table, 85 or 62 per cent., are still in course of extension, while tracklaying is about to begin on a large number of other lines not included in the list. Several of the great railway companies will each lay hundreds of miles of additional track before the year ends. Among them may be named the St. Paul, Minneapolis and Manitoba, who promise to add about 700 miles to the 300 miles or more which they have put down since January 1; the Atchison, Topeka and Santa Fe, whose Kansas City line alone will add about 350 miles before the year closes, while their various extensions in Illinois, Missouri, Kansas, Colorado, Texas and California will probably require 700 or 800 miles more to be laid in the next six months; and the Missouri Pacific, Chicago, Rock Island and Pacific, Chicago, Milwaukee and St. Paul, Chicago, Burlington and Quincy and several other great systems, which each have hundreds of miles in process of construction.

It is not difficult therefore to foresee that 6000 miles or more of track may be added during the coming six months. Of the 3754 miles already laid this year over 2060 miles have been contributed by seven companies as follows: Atchison, Topeka and Santa Fe, under various titles, 632 miles; Missouri Pacific, several companies, 332 miles; St. Paul, Minneapolis and Manitoba, 310 miles; Chicago, Rock Island and Pacific, in Kansas and Nebraska, 252 miles; Chicago, Milwaukee and St. Paul, 215 miles; Chicago, Burlington and Quincy, 211 miles; Southern Pacific, 100 miles. Several other companies have nearly equalled or exceeded some of these figures, but these are given as representative.

The Chicago building trades' lockout has grown to be a wearisome story, but the end cannot be far off. The Bricklayers' Union have rejected the proposition to submit certain questions to the arbitration of a United States Judge, but the Master Masons' Association have decided to agree to the plan of arbitration proposed by the Bricklayers' Union some time ago, according to this plan, five persons are named as representatives of each side, and they are to select an eleventh member of the arbitration committee, who will probably be a Cook County Judge. The master masons have instructed their members of the committee in no case to step outside the principles laid down in the platform adopted at the beginning of the fight. This means that the master masons will insist on the recognition of personal liberty—or, in other words, the right of any man to work or not to work as he chooses, and the right of an employer to engage any man he chooses without the intervention of the union. If the bricklayers' committee are not willing to concede this point at the start, there will probably be an end to the negotiations for the present. The material men are credited with the progress thus made toward a settlement. They are getting very tired of waiting for business, and are anxious to resume operations. The brickmakers have already done so, in order to have stock on hand when building is actively resumed. Representatives of other lines are chafing at the protracted delay in arriving at a settlement. Together they have exerted a powerful pressure on the master masons in favor of arbitration. Public opinion has strongly backed them up, and, notwithstanding a pugnacious element among the master masons that was disposed to stand out until the strikers joined the new union, the appeal to arbitration has at last been made by both the leading organizations in the fight.

We are indebted to Messrs. Kieckhefer Bros. & Co., Milwaukee, Wis., for their No. 2 illustrated catalogue of their manufactures. The catalogue is an elaborate cloth bound volume, 8½ x 11 inches in size, and contains over 200 pages. The contents are arranged in departments, the classification being as follows: Piece-d Tinware, Sheet Iron Goods, Deep Stamped Ware, Shallow Stamped Ware, Tinners' Stamped Trimmings, Tinners' Miscellaneous Supplies, Metals, Japanned Ware, Japanned Toys, Japanned Trays, Granite and Agate Ware, Perfection Granite and Agate Ware, Spoons, Wire Goods, Iron Goods, Miscellaneous Goods, Lanterns and Lamps. A department and alphabetical index occupy the last pages of the volume. The book is very fully illustrated, each page containing a number of cuts. Lists of sizes are printed in all cases, but no prices are given. This omission is explained on the ground that as the list prices are frequently changed the book would be rendered useless in a short time. The manufacturers state, however, that they will be pleased to furnish on application price lists on all the goods contained in the catalogue. The volume is gotten up in good taste, and the excellence of the cuts and typography render it a handsome as

well as serviceable volume. The front page of the catalogue presents a general view of the Milwaukee Stamping Works, besides portraits of the proprietors, the Messrs. Kieckhefer and Mr. S. Walter.

Iowa Jobbers' and Manufacturers' Association.

The Iowa Jobbers' and Manufacturers' Association met at Dubuque, Iowa, on the 28th ult., for a two days' session. Delegates were present from Des Moines, Cedar Rapids, Sioux City, Ottumwa, Oskaloosa, Fort Dodge, Clinton, Davenport, Dubuque and other Iowa cities. The largest outside delegation came from Des Moines, numbering 18. The convention was opened by President Harbach, of Des Moines, who delivered an address. The afternoon session of the first day was spent in listening to addresses by the State Railroad Commissioners and others. Commissioner Coffin laid particular stress on the fact that the agricultural interests were identified with the jobbing and manufacturing interests. The impression had got out that the farmers were not in sympathy with the other classes, and he, as the representative of the agriculturists, wished to correct that impression. He considered all their interests as identical.

On Wednesday a number of papers discussing business questions of interest were read by the members. The committee on resolutions presented several, which were adopted by the convention, the substance of which was that railroad companies should give Iowa jobbers and manufacturers such rates as would enable them to compete with outsiders; that the advance in passenger and baggage mileage is an extortion, and asking the enactment of a law by the next State legislature establishing a uniform passenger rate of 2 cents per mile; and that the Hennepin Canal should be constructed by the general Government. The new officers are: president, W. H. Torbert, of Dubuque; secretary, W. W. Ainsworth, of Des Moines; executive committee, J. W. Conchar, of Dubuque, George C. Baker, of Des Moines, and A. B. George, of Cedar Rapids. The convention meets next year at Spirit Lake, the third week in June, in conjunction with the wholesale grocers of the Mississippi valley.

New Oscillating Engines for a Sound Steamer.

The contract for building the engines and boilers of the new side-wheel passenger steamer for the Providence and Stonington Steamship Company has been awarded to the Cramps, of Philadelphia. The engines will be double-expansion compound, inclined, direct-acting, surface-condensing "oscillators," with one crank-pin. The cylinders will be set at an angle of 100° with each other. The high and low-pressure cylinders will be 56 and 104 inches diameter respectively, both to have 11 feet stroke. The high-pressure cylinder will stand forward and the low-pressure aft. Both cylinders will have the Wheelocks automatic gridiron cut-off valve gear. The trip gear will be arranged so as to be changed while the engines are working. The valves will be worked by the Stevenson link motion, by means of eccentrics on the main shaft. The reversing gear, starting gear, throttle, &c., will be all worked from a convenient platform.

The main air and feed pumps will be worked by a separate compound engine. The paddle wheels will be of the feathering type, 29 feet diameter, with 12 buckets, 14 feet face and 4 feet 6 inches wide. Steam will be supplied by 6 boilers 12 feet 6 inches diameter, and 20 feet 3 inches long. The boilers will carry 120 pounds steam pressure. Each boiler will have 3 corrugated furnaces 48 inches diameter and 7½ feet long. The engine is expected to develop about 4500 I. H. P. at 25 revolutions per minute, and was designed by Mr. George B. Mallory.

The Tuscaloosa (Ala.) Coal, Iron and Land Company, having purchased a large steam drill, will drill on the lands in the vicinity of the city preliminary to opening a large coal mine, to be to Tuscaloosa what P. Att mine is to Birmingham. The Tuscaloosa Northern Railway is being located. Contracts will be let within 60 days. Bids have been called for.

The Licking Iron Company, of Shawnee, Ohio, have been closed by the sheriff. The company were incorporated in 1866 with a paid in capital of \$100,000, J. C. Hamilton being the president. The concern was backed by E. L. Harper & Co., of Chicago, who became the principal stockholders some years ago, and it was involved by Harper's bad failure.

The rapid growth of American trade in Mexico has prompted a movement on the part of Europeans at Vera Cruz to counteract this tendency, and an earnest discussion has arisen in favor of declaring the city of Vera Cruz a free port. It is argued that the creation of a free port at that point would lead to the establishment of many branch houses, and especially by European merchants, who would devote their energies not only to selling their wares, but to developing the national agricultural interest in order to secure their payment, thus benefiting the country at large. It is asserted that this plan will aid English, French and German commerce with Mexico, and help European trade maintain itself against American competition, which is fostered by the Central and National railways.

A Western telegram says: "The oil producers of the Lima, Findlay and North Baltimore fields, in Ohio, have signed an agreement with the Standard Oil Company to cease production for nine months in order to give the Standard Company a chance to find a market for Ohio's crude oil as fuel. This action is the result of a meeting of the producers to consider means of increasing the price of crude oil."

Index to Advertisements.

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Montross Roofing Specialties.

The Metallic Roofing Company, of Canada, Limited, with office and factory at No. 82½ Yonge street, Toronto, Ontario, are putting upon the market a number of specialties in the line of sheet metal roofs that will interest our readers. Some of them are illustrated in the accompanying engravings. Fig. 1 shows a form of siding which is made under the Montross patents on shingles. It is claimed to successfully allow for contraction and expansion, as well as for uneven settling of the building; accord-

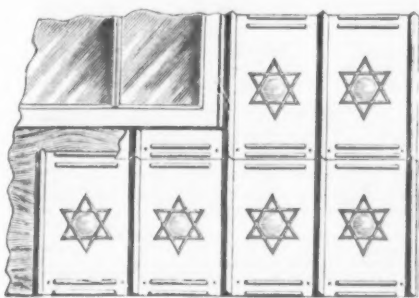


Fig. 1.—Sheet Metal Shingles Used for Siding.

ingly, it is recommended for use for factories, elevators, warehouses, &c. In the size in which it is made, each sheet covers when laid 17½ x 22½ inches. Fig. 2 represents what is known as the company's "No. 1" pattern of shingle. These shingles are provided with a simple side-lock, shown in Fig. 3, which represents an enlarged cross-section. It is claimed for this lock that it forms a thoroughly storm proof, telescopic joint, and, at the same time, amply provides for contraction and expansion in any changes of temperature. The upper ends of the shingles are nailed to the sheeting, leaving the lower end and sides free to move by

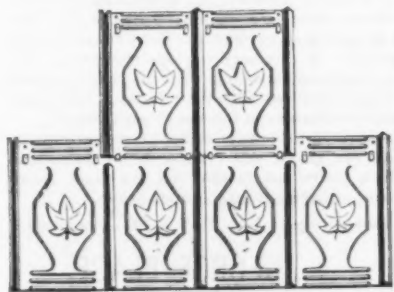


Fig. 2.—Montross No. 1 Shingle.

contraction or by expansion. The lower end is held in position by cleats, which are clearly indicated in the engraving. These cleats are riveted on the upper edge of the lower shingle, and when they leave the factory are in the position shown by the two outer shingles in the lower row in Fig. 2. As the upper course is laid, these cleats are bent up and over the lower end of the upper shingle and thus fasten it in place. By this construction, the makers point out, the nail heads are covered by the course above. The shingles are made of double pattern, as indicated in the cut—that is, each shingle has two figures—and in laying the joints are broken. Thus Fig. 2 represents three com-



Fig. 3.—Section Through Side Lock.

plete shingles in position. The upper and lower edges are provided with a number of corrugations which serve to break up the surface and stiffen the sheets, and, by a system of interlocking, prevent rain or snow driving through. In laying the courses, lap about 3 inches. The size commonly manufactured covers 15 x 22½ inches.

Fig. 4 represents what the company call its "Perfection" pattern. This device is manufactured of a size to cover 11½ x 12 inches. It is made from square plate, and the edges are of the forms shown by the outlines in Fig. 5. In construction this shingle may be described as an improvement on the celebrated "Canadian" or "Diamond" roofing, that has been so widely and favorably

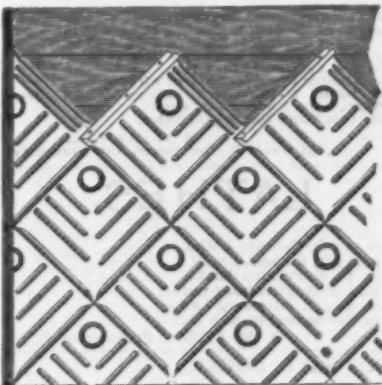


Fig. 4.—The Perfection Pattern.

known throughout the country for 75 years or more past. The shingle is claimed to possess the advantage over the so-called "Canadian" roofing of having an expansive lock-joint along one of its lower inclined edges and a nailing flange and lock along the opposite edge, as illustrated in the cross-section in Fig. 5. The other edges are provided with certain corrugations that stiffen the plates, causing them to fit more closely together and adding to their appearance on the roof. The makers point out that with this flange the necessity of nailing through the lock or body of the plate is entirely obviated. They also state that these shingles may be laid on the roof right or left, in horizontal or oblique

courses, as may be preferred. Any number of men may simultaneously work on the same course, an advantage which, it is claimed, no other metal shingles admit of. Accordingly, it is only a question of the number of men, in order to complete the



Fig. 5.—Cross Section Through Lock.

largest roof in a single day. Our last illustration, Fig. 6, shows what the makers call their Dimension shingle. This shingle employs the same lock as illustrated in Fig. 5. The shingles when laid cover 8½ x 12 inches. They are struck up in a pattern to represent smaller sizes, and very closely imitate the

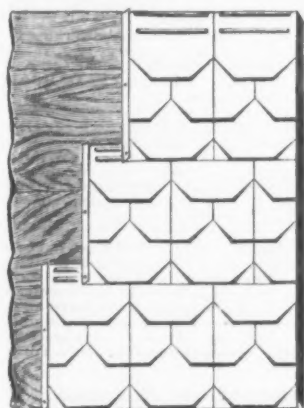
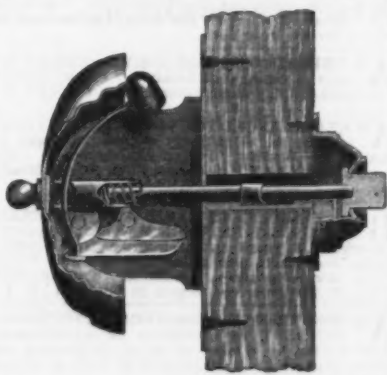


Fig. 6.—Montross Dimension Shingle.

appearance of shingles, slate or tile when in position. We understand that these goods are made of tin or galvanized iron, as required.

Gong Door Bell.

The Russell & Erwin Mfg. Company, of New York City, are putting upon the market the gong door bell, with push button, illustrated in the accompanying engraving. The appearance of the outside finish is not unlike that of the electric or pneumatic bells that are largely in use at the present time. The button, including its escutcheon, is manufactured in various styles, to agree with the hardware of the door. By pushing upon the button, the shaft or rod connecting with it is forced back in a way to compress the spiral spring shown at the left of the engraving. In moving forward it trips the trigger that controls the hammer of the bell, and in returning to its normal position, by the action of the spring, the trigger is tripped a second time. Accordingly, a single push upon the button results in two quick, hammer-like



New Door Bell, Brought out by the Russell & Erwin Mfg. Co.

strokes upon the gong. The gongs are struck up of steel and are handsomely plated, and have a very clear sound. The other parts of the bell are made of the best material, and the mechanism is so simple in character as to make the article very cheap, and yet is of a kind not likely to get out of order. The bells are furnished in different styles to suit the wants of the trade.

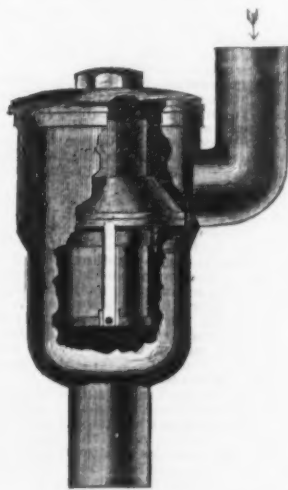
Railroad discrimination appears conspicuously in the methods of the Union Pacific Railroad. The investigating commission, which completed its labors at Omaha, received a letter from Guy C. Barton, a friend of the Omaha and Grant Smelting and Refining Company, of Omaha, in compliance with a request of the commission, showing that the total amount of rebates and overcharges paid to that company by the Union Pacific from September 1, 1883, to April 1, 1887, was \$57,011,226, and that the total amount of dividends paid to Fred. L. Ames and Sydney Dillon from the smelting company during the same period was \$30,800 each. Other companies were favored in like manner.

Senator Cullom, one of those who were most active in framing the provisions of the Interstate law, says that sufficient progress has been made under the application of the law to justify the opinion that the first result was to place all men more nearly on an equality with respect to advantages in the shipments of their products. The law, he said, in an address before the Illinois Grain Association, marked the beginning of a new era in railroad administration, and is the actual culmination of a long struggle for supremacy between the people and the combined power of the railway corporations. He did not claim the law to be perfect. It was in a sense experimental, but it was a declaration by Congress of its power over the subject, and of its determination that these privileged corporations should be conducted in the interest of the people. "The act will not be repealed," said he, "and if any persons or corporations imagine it will they may as well dismiss that expectation. Its substantial provisions have come to stay, because the people will find out, if they have not already, that they are in the interest of

the general welfare." In reference to the long and short haul clause he said: "For many years the railroads of the country have so absolutely controlled our Interstate commerce that we have no means of knowing what are the natural channels of traffic or what would be the effect of the natural laws of trade upon many, at least of the present commercial centers. What the critics of the law call 'natural centers of trade' are centers created by railroad favoritism which has diverted trade from its natural channels into artificial ones at the expense of less favored localities." The Senator said he did not join in the charge that the railroads are attempting to render the law obnoxious. He credited them with too much business sagacity for that. Such a course could only prolong a struggle that would end speedily by quiet acquiescence in the will of the people expressed in the law.

The Sheehan Sewer and Stench Trap.

The Sheehan Sewer Trap Company, Cleveland, Ohio, are putting on the market a trap shown in broken view in the accompanying cut. The course of the water through the trap is indicated by the arrows. The water coming down the waste-pipe fills the top of the trap, but forces an outlet after it has risen to a height of 4 inches—that is, the trap holds a 4-inch seal. The pipe shown in the upper part of the trap-chamber is closed by a valve held in position by a counter-weight. Under a certain pressure the valve is forced down and the water escapes through an annular opening into the bottom of the trap chamber. The valve is kept closed—that is, forced upward to its seat by means of a weight hung below. An ingenious mechanism is employed

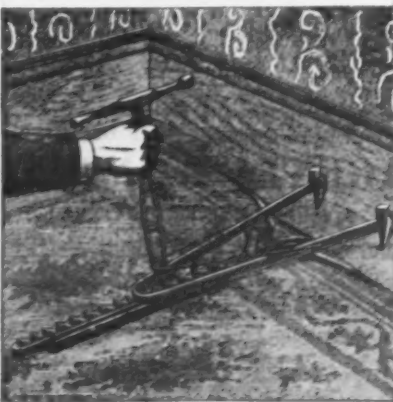


The Sheehan Sewer and Stench Trap.

to transform the downward motion of the weight into an upward thrust against the valve. The interior fittings of the trap and the cap which screws on are made of brass, the body of the trap being of lead or brass, as the case may be. The brass trapping device is removable, but a tight joint is secured by means of a rubber washer. Among the claims made for this trap by the manufacturers is that, in addition to the water seal, it is provided with an air, gas and water-tight valve. It is further said that the trap is absolutely free from the danger of clogging, is constructed on the balance principle, and all parts are interchangeable. The Sheehan traps are made as full S, half S and running, in various sizes and in nine different styles.

The Keystone Carpet Stretcher.

This article is put on the market by Pickett & Rogers, Warren, Pa. It is represented in the accompanying illustration, which indicates also the manner in which it is used. This carpet stretcher consists of three parts, one having the clamp which holds the carpet, another which is secured in the floor next to the base-board, and the lever by which the power is applied in stretching the carpet. This lever also, after the carpet has been stretched to the desired extent, serves the purpose of a hammer. It will be observed that this stretcher is so constructed that, after the carpet has been placed between the jaws of the clamp, the force exerted by the lever tightens the grip of the clamps, and the force being continued moves the clamp, and, consequently, the carpet in the



The Keystone Carpet Stretcher.

desired direction. As the carpet is forced in place it is held by means of a ratchet, which engages with the rear portion of the part which is fastened in the floor, thus permitting the removal of the lever or hammer for driving the tacks. These stretchers are made entirely of malleable and wrought iron. The efficiency with which they do their work, the ease with which they are operated, and the fact that they clamp the carpet in such a way that they cannot tear or injure it, are points made by the manufacturers.

New Eave Trough Hanger.

A new adjustable eave trough hanger, to be known in the trade as the Improved Yankee, is offered by the Moore & Barnes Mfg. Company, 103 Chambers street, New York. The larger of the two engravings used herewith shows the details of the device,

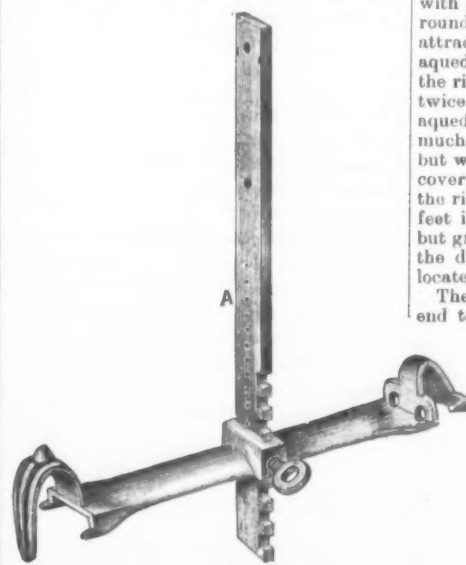


Fig. 1.—The Improved Yankee Adjustable Eave Trough Hanger.

while the other shows the application to a roof. The cross bar is provided with points or punches at each end. One end is adapted for receiving the bead of the gutter, and the other to engage with the back edge. The strap, in addition to being perforated for convenience in nailing, is marked on one side by a series of dots. These constitute the bending gauge. The distance between the dots is right to give the proper fall to a gutter attached to a horizontal eave, if each succeeding hanger is bent one point lower. In addition to this there is a 3 inch adjustment provided in the thumb-screw, and notches on the side of the strap. Among the advantages to which the makers direct attention may be mentioned the neat appear-

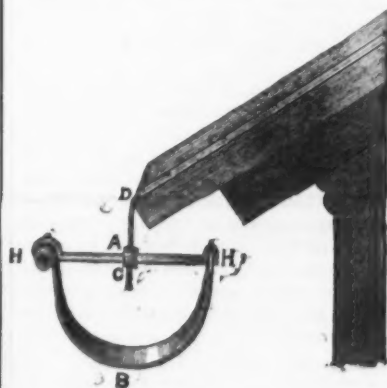


Fig. 2.—Gutter Hung with the Improved Yankee Hanger.

ance of gutters hung by this device, the rapidity with which work can be done, and the ease with which work can be taken down for repairs or painting.

Progress on the Aqueduct.

The new aqueduct to supply New York City with water is approaching completion much more rapidly than is generally supposed. Already 90 per cent. of the excavation is finished, and about 30 per cent. of the brick lining; and, unforeseen accidents barred, the entire work will be completed before the end of the present year. Thus will be given to New York another notable marvel of modern engineering, and a work which will command the attention of scientific tourists and students for many years to come before it shall be rivaled in magnitude.

A few general figures will give a better conception of this work than now obtains. The aqueduct is in reality a continuous tunnel, thirty miles in extent, with a sectional area of 155½ feet, or sufficiently large to accommodate an ordinary train of cars. It traverses a broken country, now beneath lofty hills, again crossing deep valleys; diving at times under broad rivers; most of the way cut in solid rock, its average depth beneath the surface being about 150 feet. Excepting where it is carried under water courses, it maintains a perfectly regular though slightly descending grade, and yet will deliver its vast river of water at the highest elevation on Manhattan Island, thus giving a head for distribution which will carry it to the tops of the loftiest buildings.

The present aqueduct has a sectional area of but 53½ feet, or but a trifle more than ½ of the new. Thus the new will be capable of furnishing the city three times the volume of water which the old aqueduct could convey, even when pressed to its utmost capacity, as it has been for several years past, to the great anxiety of the engineers and others concerned. Indeed, the public has happily not appreciated the very great danger to which the city has been subjected of late years on this account. The old aqueduct is a comparatively light structure, running near the surface, and never intended in its construction to withstand any internal pressure. It could carry with perfect safety two-thirds or three quarters its full capacity, but was never intended to be completely filled. But of late years it has been crowded and compelled to carry the last possible gallon, thus subjecting it to continual pressure and a liability to burst at any time. And while thus forced to its utmost, it has been unable to supply any excess of water, so that should any accident befall it the city

would be brought face to face with a water famine of the most serious character. In the construction of the new aqueduct, one of the most notable pieces of engineering is the crossing of Harlem River. Everybody knows that the old aqueduct crosses on the High Bridge at an elevation of 120 feet above mean high water. That lofty bridge, with its massive stone piers and beautifully rounded arches, has long been one of the attractions of the metropolis. The new aqueduct, however, passes under the bed of the river at a depth of 225 feet, or nearly twice as far below the water as the present aqueduct is above it. This great depth is much more than was originally contemplated, but was found necessary because of the discovery of a fissure in the rock underlying the river. This fissure was found to be 12 feet in width near the bottom of the river, but gradually narrowed until it was lost at the depth at which the tunnel was finally located.

The tunnel is to be lined with brick from end to end, and at the crossing of rivers is additionally strengthened by iron tubing. It passes under the Harlem in the form of an inverted syphon, or a letter V, and, of course, will be subjected to immense strain at its lower angle. This strain is met by doubling the thickness of the brick lining and the addition of the iron tubing already spoken of. A little distance above the Harlem River, between shafts 13 and 14, a very troublesome body of quicksand was encountered which baffled all the efforts of the engineers to overcome. When struck it ran into the tunnel with such force and rapidity that the workmen barely escaped

with their lives, running at their utmost speed. It filled the tunnel back to the shaft, and months of work were vainly expended in the effort to exhaust it. Then an additional shaft was sunk midway of the bad land, through which drainage was established, and only recently has progressive work been rendered possible at that point. The contractors, Clark & O'Brien, expended nearly a quarter of a million of dollars in seeking to overcome that troublesome encounter before they were relieved by the extra shaft. Returning to details of the work, which was begun in May, 1885, the exact length of the aqueduct, including 8184 feet of open cut, is 164,864.4 feet. Of this the contracts of Brown, Howard & Co. covered 66,771.1 feet, of which the excavations are completed on 58,329.9 feet, leaving 8442 feet to be completed. Clark & O'Brien's contracts cover 73,099.5 feet, of which they have finished 71,763.5 feet, leaving 636 feet yet to be accomplished. John Brunton & Co. are contractors for 11,810 feet, all south of the Harlem River, of which they have completed 8536 feet, leaving 3274 to be excavated. The cost of the work in dollars and cents up to June 1 has been \$10,235,666.07, of which \$49,152.14 was paid for land and land damages, \$314,111.47 on account of commissioners of appraisal, \$8,945,288.56 for actual work of construction, and \$927,113.90 for salaries, supplies, examining engineers, rock borings, &c. But the dollars and cents are only a portion of the cost of the great work. There has been a very large sacrifice of human life and limb in the work, which must be added to the account. Up to the 1st of February last there had been killed on the entire work 70 men, and 116 more or less seriously wounded. Since that date there have been a number of additional accidents, materially extending the list of casualties. Of those given, 39 dead and 58 wounded are chargeable to the account of Brown, Howard & Co.; 28 dead and 51 wounded to Clark & O'Brien; 2 dead and 7 wounded to John Brunton & Co., and 1 dead not located.

But the completion of this aqueduct with the present year will give to the city no additional supply of water, merely removing the danger of an absolute stoppage of all supply, and providing a means for conveying more water when it is obtainable. The present aqueduct is capable, so long as it may stand and perform the extra duty put upon it, of conveying to the city all the water collected by the present Croton dam. But that dam by no means retain all the water of the Croton River. To secure that full supply a system of new dams has been devised and is embraced in the new aqueduct scheme. One of these, the Sodom dam, is intended to catch and store the water of the east branch of the Croton, holding it for use when required. The preliminary work for securing the land required for that dam and reservoir is now well advanced. The Muscot dam takes the water above the level of the Croton dam, and in like manner stores it to be fed to the lower or main reservoir, as needed. That work has been ordered, and the surveys and designations of lands required are in progress. Finally, the Quaker Bridge dam proposes to catch all the water of the Croton water-shed and store it immediately at the entrance of the new aqueduct, to be drawn upon at all times. That dam, and the land it will submerge, will cost from \$7,000,000 to \$10,000,000, and has been decided upon with great hesitancy. It will require a number of years to build it, and when completed it will be the greatest dam in existence. The Sodom and Muscot dams will supply all the water required until the Quaker Bridge dam is completed, and that will then supply the anticipated wants of a quarter of a century to come. The work on these dams should have been begun several years ago. As it is, the new aqueduct will be completed at least two years before it will have any more water to carry than is now being brought to the city.

Secretary Fairchild has addressed a circular letter to importers of steel wire rods stating the claim of the American Iron and Steel Association that importations of steel wire rods smaller than No. 5 wire gauge should be classified for duty at the rate of 1½ cents per pound as "steel wire," and saying that if the importing interests desire to be heard on that question they will be given an opportunity to do so any time after July 7.

Special Notices.

BUSINESS OPPORTUNITIES.

ATTENTION,

Capitalist - and - Foundryman.

An Incorporated Company offers for sale State Rights to manufacture, and sell a valuable Patent Boiler (for house-heating). Hundreds in successful operation, which can be referred to for full particulars.

Address Box 1006,

WORCESTER, MASS.

New England States reserved.

National Storage Co.

PAID UP CAPITAL \$100,000.

This company is prepared to issue Warehouse Certificates on manufactured product and raw material, such as iron, lead, coal, lumber, wool, hides, broom corn, tobacco, pork, dry goods, groceries, machinery, etc., or any class of personal property.

Stored on the Owner's Premises IN CHICAGO, OR ELSEWHERE.

DIRECTORS:

L. J. Gage, C. R. Cummings, D. B. Dewey, E. G. Keith, C. L. Hutchinson, J. E. Walsh, W. R. Hammond, J. P. Odell, Chas. Hummel, R. H. Lewis, G. S. Willis.

Refer to any of the Banks of Chicago.

CHICAGO OFFICE. 54 Montauk Block.

W. O. STEPHENS, Secretary and Manager.

Correspondence solicited.

FOR SALE.

THE MACHINE SHOP AND FOUNDRY

with six acres of land, now occupied by

THE STILES & PARKER PRESS CO., situated in the city of Middletown, on the Connecticut Valley Railroad. This is the only Jobbing Machine Shop and Foundry on the Connecticut, between Hartford and the Sound, and has the patronage of most of the surrounding towns; possessing good facilities for freightage by the Connecticut River and three railroads. Proposing to remove our business from the city, we will sell this property at a reasonable price, and part payment may be made in cash. Possession given about October 1st. Apply on the premises, or by letter to

N. C. STILES, Treasurer.

Notice! Manufacturers and Capitalists!!

The coal regions of Pennsylvania are attracting manufacturers generally, and your special attention is called to Pleasant Valley, near Scranton, Pa., which presents superior advantages. Location central. Eligible sites. Cheap fuel. Water abundant. Special inducements to any who will locate. Railway facilities unsurpassed. Four of the largest railway systems of the Middle States centering here. Particulars on application to

THE BOARD OF TRADE,

Avoca P. O., Pa.

FOR SALE.

A rare chance to buy a clean and well-sorted stock of

HARDWARE, STOVES & TINWARE

in one of the best towns in Michigan. Stock will include \$6000. The best of reasons for selling. Address "JAP," office of *The Iron Age*, 66 and 68 Duane St., N. Y.

CAPITAL WANTED.

From \$10,000 to \$25,000 in an enterprising hardware factory. Have continuously introduced to the trade a new and novel line of goods in the BUILDERS' HARDWARE line, and would guarantee a profit to the investment of capital.

WM. GERWIEN,
7 and 9 So. Jefferson Street, Chicago, Ill.

FOR SALE.

A good HARDWARE BUSINESS in Gainesville, Ga.; the only business of the kind in a place of 5000 people, the healthiest town in Georgia, with twenty counties' territory; reason for selling, the owner wishes to engage in the manufacturing business. For further information, apply to

S. C. DINKINS & CO.,
Gainesville, Ga.

CAPITALISTS, ATTENTION!

Wanted, Parties with from \$25,000 to \$50,000, to take an interest in a

LIGHT MANUFACTURING BUSINESS;

just the thing for the Natural Gas Regions. Address "BUSINESS," Box N, Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

FOR SALE.—A first-class HARDWARE STOCK

AND BUSINESS, with established custom. Location Central West, in large town and rich country. A rare business opening. Address "WILSON," Office of *The Iron Age*, 66 and 68 Duane Street, New York.

FOR SALE, to close an estate,

A HARDWARE STOCK

of \$15,000 in the best business city in Michigan. Business established twenty-five years. Address "HARDWARE STOCK," Office of *The Iron Age*, 66 and 68 Duane St., New York

FOR SALE, a large and well-sorted stock of

HARDWARE.

A long-established and profitable business at the old hardware stand, No. 207 Main Street, Jamestown, N. Y. Advantageous lease of store extending to May 3, 1891. Business includes several valuable specialties. The entire business will be sold at a bargain. Complete inventory ready for inspection. For particulars, address A. FRANK JENKS, Administrator of the estate of D. C. Mackus, Jamestown, N. Y.

FOR SALE.

A GOOD CLEAN HARDWARE STOCK.

In a town of four thousand inhabitants in Southern Dakota; annual sales, \$35,000. This is a rare chance and will bear investigation. Cause of selling, death in family. Address "LOCK BOX 173," Mitchell, Dak.

Alabama's Mineral Belt.

Parties wishing information about, or investment in, Alabama Mineral, Lumber or Agricultural lands, will please address, with stamp,

EDWARDS & ARNOLD,

Talladega, Ala.

Special Notices.

BUSINESS OPPORTUNITIES.

FOR SALE.

THE MELVIN SEWING MACHINE CO.'S FACTORY AND GROUNDS.

located in Chillicothe, Ross Co., Ohio, and adjoining the depot grounds of the C. W. & B. and Scioto Valley Railroads. The main building is of brick, 133 x 33 feet; three stories, slate roof, well-lighted and floors 6 in. thick. The Engine, Boiler and Japan rooms and Blacksmith shop are all of brick and covered with tin. The whole building heated by steam and lighted by electricity. It contains a 45 horse-power Reynolds-Corliss Engine, a 75 horse-power Babcock & Wilcox Boiler and Edison Dynamo, all in good condition. One house and lot and three vacant lots, all adjoining the factory grounds. This is a desirable property for manufacturing purposes, and will be sold at a bargain. For further particulars call on or address

NELSON PURDUM, Receiver,

Chillicothe, Ohio.

FOR SALE OR TO LEASE.

at Perth Amboy, New Jersey, adjoining wharves of the Lehigh Valley R. R. 350 feet of water, admitting largest ocean steamships without obstruction of any kind, 1800 feet dock front by 4000 feet in depth. This property is crossed by the Lehigh Valley Railroad, the Pennsylvania Railroad and the N. J. Central Railroad, and, besides being on one of the finest Harbors on the Coast, is also on the line of the Delaware and Raritan Canal Towing Line. Thirty feet of Water in front of property, and three Railroads, Lehigh Valley, N. J. Central and Pennsylvania, all crossing the track. See map on page 49. Address

WILLIAM T. MEREDITH,

No. 45 Wall St., New York.

VALUABLE IRON MINE FOR SALE.

This property covers an area of 3.0 acres and exhibits at various points an Ore giving 66 per cent. of iron—furnace best—no sulphur or phosphorus. The property is situated within 10 miles of Ottawa and is most favorably placed for mining operations. The highest reports upon the property have been received from first-class experts. Title perfect. The new Canadian Iron tariff makes this a most valuable property. Samples of the Ore and further particulars can be obtained by applying to the Manager—Ontario Bank, Ottawa, Canada.

BUFFALO, N. Y.

The Board of Managers of the Business Men's Association of the City of Buffalo invite the attention of Capitalists, Manufacturers and Business Men generally to the unusual advantages of Buffalo as a manufacturing and distributing point. Parties interested in statistical evidence which will prove the claims of our City as to possessing very superior advantages in facilities for transportation, cheap fuel, low taxes and an exceptionally thrifty, capable and non-striking industrial population and other substantial inducements, are invited to correspond with this Association.

Edmund Hayes, John C. Graves, Ralph Plumb, George W. Francis, Charles A. Gould, Walter J. Shepard, George P. Sawyer, George W. Miller, C. W. Hammond, James Crate, C. H. Lewis, T. Guilford Smith, Stephen P. Sherman, Thomas Hodgson, Daniel O'Day, Edward H. Fowler, Wm. H. Johnson, Joseph P. Dudley, John H. Smith, Henry C. French, H. K. Folinsbee, Henry Koons, George D. Briggs, John Satterfield, Millard F. Windsor, Jan. B. Stafford, President, Wm. HENCKLER, 1st Vice President, R. R. HOFFORD, 2d " " R. E. NOYE, 3d " " JOHN L. WILLIAMS, Treasurer.

FINE BUSINESS CHANCE.

FOR SALE, an established HARDWARE, TIN, QUEENSWARE and STOVE BUSINESS of five years standing, in one of the best towns on the Texas and Pacific R.R., 22 miles West of Fort Worth, Texas, in the heart of the cattle and sheep district of the State of Texas, with a population of 3000, and growing every year; stock about \$2000 or \$3000, all fresh and new. For particulars, address GEO. MILLER, Colorado, Texas.

FURNACE FOR SALE.

A good Charcoal Iron Furnace in Michigan. For particulars, inquire of E. C. POPE, 11-13 Wade Building, Cleveland, Ohio.

WANTED, PARTNER

with equal capital of \$10,000 to engage in profitable business easily learned. Address "A," Box 73, *The Iron Age*, 66 and 68 Duane Street, New York.

WANTED TO SELL, the leading HARDWARE

BUSINESS of Denver, Col., located in the heart of the city; good fixtures and one of the best-equipped stocks in Colorado. For further particulars, address No. 2086 Jay St., Denver, Col.

FOR SALE.—Stock of Iron, Steel, Wagon and Car

riage material, both iron and wood; also, large convenient Store Room, located in growing manufacturing and now booming city of Quincy, Ill., the second city in the state, population about 40,000; quite a railroad centre, and on the great Mississippi River. Excellent traveling territory on every side; for fine, rich country scarcely equalled. Business established twenty years. Money made every year. The only store of the kind in the city. Reason for retiring, bad health.

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Quincy, Illinois.

RARE OPPORTUNITY.—A first-class MALLE-

ABLE IRON WORKS located in the City of Rome, N. Y., for sale at half its value.

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At GREENWOOD, OHIO, on C. & A. R. R., in one of the best farming cities Northwest, O., a General Hardware and Grocery Store, with entire stock of goods; a fine residence with good dwelling house and ornamental trees; fine fruits; fine well of water and cistern; 2 acre lot; good stable and outbuilding; a good place to live and good trade; all clear of debts; best bargain ever offered; will double in 3 years; worth \$7000 to a lively business man. J. C. MORRIS, Wren P. O., Ohio.

WANTED, A PARTNER

with capital to commence business for a NEW PATENT COMPOUND VALVE. Patent secured and hydraulic work and other machinery. Will sell or take share in a firm. Address

"BOX 945,"

Cohoes, N. Y.

Special Notices.

BUSINESS OPPORTUNITIES.

RECEIVER'S SALE

OF THE

REAL ESTATE OF THE MAIDENCREEK IRON CO.

Of Blandon, Berks County, Pennsylvania.

Pursuant to an order of sale issued out of the Court of Common Pleas of Berks County, will be sold at public sale on Saturday, July 23, 1887, at 2:30 o'clock, P. M., at the public house of R. S. Under, in the village of Blandon (a station on the East Pennsylvania Railroad, eight miles North-east of the City of Reading), Berks County, the following described real estate of the Maiden Creek Iron Company, viz:

No. 1. All those certain six two-story frame dwelling houses and lots of ground on which the same are erected, situate in the village of Blandon, Maiden Creek Township, County and State aforesaid; bounded on the North by a public road, East by other property, the Maiden Creek Iron Company, South by a ten-foot wide alley and West by property, late of Charles Levan, containing in front 120 feet and in depth 175 feet and 6 inches.

No. 2. All that certain messuage, tenement and tract of land situate in the Township of Blandon, said County of Berks, bounded by lands of Samuel Bernert, Samuel Kismiller and others containing 9 acres more or less. Also a tract of land adjoining the one just described, bounded by lands of Samuel Kismiller, Henry Bernhart and others containing 1 acre and 13 perches. Also the undivided three-fourths part of a tract of land situate in the Township last above named, bounded by a public road, lands of Moses Rothmel and others, containing 23 acres and 20 perches. The tracts composing No. 3 being known as the "Sand Hole Tract."

No. 3. All that certain tract of land situate in Maiden Creek Township, said County of Berks, known as the "Weaner Tract," bounded by lands of Samuel Bernert, George Moyer and others, containing 35 acres and 33 perches. Also a message and tract of land containing a dwelling-house and other buildings, situate in the Township and County last above named, bounded by lands of Wm. Sickel, a public road and the East Pennsylvania Railroad, containing 1/4 acre more or less.

No. 4. All that certain message and tract of woodland situate in Ruscombman Township, said County of Berks, known as the "Shaler Tract," bounded by lands of the late Wm. H. Clymer, deceased, Jeremiah De Turk and others containing 43 acres and 120 perches.

No. 5. All that certain Rolling Mill, Office and Blacksmith shop, situate in the village of Blandon, Maiden Creek Township, said County of Berks, bounded by the East Pennsylvania Railroad, property late of Benneville Schroeder, two public roads, property of late Charles Levan, deceased, lands of Jeremiah De Turk, Catharine Madeira, Samuel Hawkins and others, containing 11 acres and 13 perches more or less. The Mill building has a length of 223 1/2 feet and a width of 127 feet. It has 3 trains of rolls, one 18-inch muck train, one 12-inch finishing train, and one 8-inch guide and hoop train; it has 11 single pushing and 2 heating furnaces; the motive power consists of 3 engines, aggregating 35 horse power; it has a steam pump, large lathe and 2 pairs shears; belonging to it are 5000 coils of various kinds; its capacity is about 6000 tons finished iron per year; it is supplied with water from a dam, sufficiently elevated to obviate the necessity of pumping; convenient sidings extend from the railroad to the mill.

This property is located in the village of Blandon, on the East Pennsylvania Railroad, 120 miles from New York, 65 miles from Philadelphia and 8 miles from the City of Reading, a thriving manufacturing town, which at all times consumes a large portion of the product of the Mill. It is particularly adapted for the manufacture of all kinds of small merchant iron.

Terms of sale: ten (10) per cent. down on Nos. 1, 2, 3 and 4; and \$50,000 down on No. 5; balance to be paid within 60 days from confirmation of sale by the Court, when deeds will be delivered.

HIRAM Y. KAUFMAN,

Receiver of the Maiden Creek Iron Co.

June 23, 1887.

Aluminium, "The Metal of the Future."

The Only Treatise in the English Language.

Aluminium: Its History, Occurrence, Properties, Metallurgy and Applications, including its Alloys. By Joseph W. Richards, A. C. Chemist and Practical Metallurgist. Member of the Deutsche Chemische Gesellschaft. Illustrated by 16 engravings. 12mo, 346 pages. Price, \$2.50, free postage. Published by the World, Containing Part I. History of Aluminium. II. Occurrence of Aluminium in Nature. III. Physical Properties of Aluminium. IV. Chemical Properties of Aluminium. V. Metallurgy of Aluminium. VI. The Manufacture of Sodium. VII. Manufacture of Aluminium. VIII. Manufacture of Double Chloride of Aluminium and Sodium. IX. Manufacture of Aluminium at Salindres (Gard). X. Reduction of Aluminium by other Reducing Agents than Sodium. XI. Working of Aluminium. XII. Alloys of Aluminium. Appendix. Addenda. Index.

A circular showing the full table of contents of this volume will be sent free of postage, to any one in any part of the world who will furnish us with his address.

HENRY CAREY BAIRD & CO.

Industrial Publishers, Booksellers and Importers,

510 Walnut St., Philadelphia, Pa., U. S. A.

METALLURGICAL ENGINEERING.

We are prepared to furnish

PLANS, SPECIFICATIONS

AND

ESTIMATES

AND TO

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ING MILLS AND MACHINERY, RE-

GENERATIVE GAS FURNACES,

TUBE AND PIPE MILLS,

ETC., ETC.

We represent the latest improvements in all the above branches.

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Metallurgical Engineer,

Rooms 16, 17 and 18 Bissell Block, Pittsburgh, Pa.

AGENTS WANTED.

In every manufacturing town to sell

DuPlaine's Plumbago Babbitt Metal.

Very liberal discount allowed and every inducement given you to make sales. Remember these are the Best Anti-Friction Metals made.

Address

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Chicago, Ill.

Send for Circular.

EUGENE BISSELL, Auctioneer.

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ROBERT R. HAYDOCK & CO., and E. BISSELL & CO.

WHOLESALE

HARDWARE AUCTIONEERS,

12 Murray St. and 15 Park Place, N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

OFFICE TO LET.

Room 3, No. 122 Chambers Street, New York, in center of Hardware District, pleasant office, up one flight. Apply to Janitor or address

A. C. FARLEY & CO., Limited,

Philadelphia.

Special Notices.

HELP WANTED.

Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

MAN TO SELL ON COMMISSION to New England trade, a first-class Brand of Files; one having good New York trade preferred. "M." Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

A FIRST-CLASS TINNER; one who thoroughly understands tinning malleable iron castings; give age and salary expected. UNITED STATES STORE SERVICE CO., 71 Trinity Place, Albany, N. Y.

FIRST-CLASS MAN who is competent to take charge of an Open Hearth and Bessemer-steel plant. Address, stating age, education, experience and salary desired, "BESSEMER," office of *The Iron Age*, 66 and 68 Duane St., N. Y.

A GOOD, RELIABLE, STEADY MAN, who thoroughly understands working heavy and light sheet iron, to take charge of a water and well PIPE MANUFACTORY; also three good sheet iron workers. Address "P. O. DRAWER 1079," Los Angeles, Cal.

A THOROUGHLY COMPETENT FOUNDRY FOREMAN to take charge of foundry making Grey and Malleable Iron. To the right party will pay large salary. None but an experienced and capable man need apply. Address "FOUNDRY," care of H. CHALL, 10 Times Building, New York City.

TRAVELER TO SELL TABLE AND POCKET CUTLERY to the retail trade in the Eastern States on commission; also one each for New York State, Pennsylvania, Ohio, Indiana and Michigan; only those need answer who have an established trade and who wish to add above goods to their line. Address "CUTLERY," Box 279, Office of *The Iron Age*, 66 and 68 Duane St., New York.

SITUATIONS WANTED.

Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

IRON BROKER, of 30 years' experience, desires an engagement with a reliable iron house; specialties, pig iron and steel scrap. Address "1625 North 25th St.," Philadelphia.

A SALESMAN, thoroughly posted in HARDWARE and IRON, and personally acquainted with the hardware trade, boiler makers and machine shops in Des Moines and Council Bluffs, Iowa; Omaha and Lincoln, Neb.; Kansas City, St. Joseph, Sedalia and Springfield, Mo.; Atchison, Leavenworth, Lawrence, Topeka, Fort Scott and Wyandotte, Kan., wishes news of Hardware, Iron, Tools, &c., on commission, visiting the above mentioned cities every six days and making headquarters in Kansas City. Address "BOX 112," Station A, Kansas City, Mo.

A HARDWARE MAN

of twelve years' experience and thoroughly conversant with the Spanish language, wishes to make arrangements TO TRAVEL for Manufacturers in the countries of South America. Best of references will be given. Address "J. H. P.," Room 15, No. 10 California Street, San Francisco, Cal.

GUIDE MILL STEEL ROLLER.—Position by a guide mill roller of experience on 8, 9 or 10 inch mill; can furnish best of reference. Address "STEEL ROLLER," office of *The Iron Age*, 77 Fourth Ave., Pittsburgh, Pa.

POSITION WITH A WESTERN HOUSE by one thoroughly acquainted with the SCRAP IRON BUSINESS, and New York trade. Address "J.," Box 72, Office of *The Iron Age*, 66 and 68 Duane Street, New York.

AN EXPERIENCED FOUNDRY FOREMAN

desires a change of locality. Please address "FOREMAN," 25 Washington Street, Chicago, Ill.

AN EXPERIENCED FOUNDRYMAN of 25 years' service as FOREMAN desires to make a change of locality. Please communicate with "FOUNDRYMAN," 206 South Fifth Street, Reading, Pa.

BY A FIRST-CLASS LOCK AND GENERAL HARDWARE PATTERN MAKER; 64 years' experience, 3 years as foreman; A No. 1 reference; no objection to going any distance for a good, steady position. Address "TEMPERATE," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

A TENDENT OF Bessemer or open-hearth steel works, by a man of large experience in above capacities. Address LOCK BOX 99, Pittsburgh, Pa.

MECHANICAL DRAUGHTSMAN, graduate M. E., with first-class references, wishes a position; able to take charge of drawing office and act as Assistant Superintendent; can offer knowledge against capital; the three languages fluently; "E. S.," 24, Office of *The Iron Age*, 66 and 68 Duane St., New York.

A GENTLEMAN who has had an extensive business experience and who possesses business abilities of a high order, would like to make an arrangement to take charge of a Chicago Agency for some first-class Eastern manufacturing firm. Best of references, both East and West. Address "H.," Office of *The Iron Age*, 66 and 68 Duane Street, New York.

WE PAY SPOT CASH

—FOR—

BRASS TURNINGS,

OLD BRASS,

OLD COPPER.

Mail sample, state quantity and name lowest spot cash price for New York.

As to responsibility, refer to First National Bank, Jersey City, N. J. Dan & Co., Bradstreet's Com'l Agency, New York.

Jersey City Smelting Works,

107, 109 and 111 Plymouth St.,

Telephone, 35 A. JERSEY CITY, N. J.

PRICE BOOKS.

LARGE SIZE, 500 Pages, 6 x 9 1/4 in. each, \$3.00.

POCKET SIZE, 350 Pages, 4 x 7 in. each, \$4.00.

Send for Circulars.

B. LAMBERSON,

PORTLAND, OREGON.

DIXON'S Traction Belt Grease and Leather

Special Notices.

27

\$100 | AMERICAN GIANT DYNAMO | \$100

Electro-Plating and Electrotyping Machines

IN ALL SIZES, FROM \$100 UPWARDS.



CHEAPEST
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Line.

NICKEL PLATING AND POLISHING MATERIALS.

ZUCKER & LEVETT CHEMICAL CO.,

ESTABLISHED 1863, INCORPORATED 1881,
SOLE MANUFACTURERS AND PATENTEES,

WORKS: 538 to 564 W. Sixteenth St, OFFICE: 36 to 40 Eleventh Ave., New York, U. S. A.

Trade Report.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]
LONDON, WEDNESDAY, July 6, 1887.

Scotch Pig.—The market is a little steadier. Scotch warrants are 42/3. Makers' brands are quoted as under:

Cottbus, alongside, Glasgow	54/6
Lancashire, " "	54/6
Glencarnock, " "	48/6
Gartsherrie, " "	49/6
Shotts, " "	49/6
Dalmellington, " "	44/
Carnbroe, " "	44/
Eglinton, " "	43/
Summerlee, " "	42/
Carriage from Ardrossan to Glasgow 181/9 ton.	

Bessemer Pig.—The market is unchanged. We quote W. C. Hematites, Nos. 1, 2 and 3, 44/ @ 45/.

Cleveland Pig.—The market is unchanged at the following prices: 37/ for No. 1 Foundry; 36/ for No. 2; 35/ for No. 3, and 34/ for No. 4 Forge.

Bessemer Billets.—Bessemer Billets, 2½ x 2½ inches, are 72/6 @ 75/.

Bessemer Blooms.—There is a noticeable effort to bull the market, and fluctuations in both directions may be looked for. Prices are nominally 75/ @ 77/6, 7 x 7 inches.

Bessemer Crop Ends.—We quote run of mill 52/6 @ 54/6.

Manufactured Iron.—The market is irregular. We quote:

Staff, Ord. Marked Bars	£ s. d.	£ s. d.
" Medium "	5 0 0	5 10 0
" Common "	4 15 0	5 0 0
Hoops, 20 W. G. and over		
" Common Best "	5 0 0	5 0 0
" Medium "	5 10 0	5 10 0
" Common "	5 0 0	5 0 0
Sheets, 20 W. G. and under		
" Ordinary Best "	5 5 0	6 15 0
" Common "	5 10 0	6 0 0

Welsh Bars are quoted £4. 2/6 @ £4. 5/.

Steel Rails.—The market is still irregular and prices have fallen off to £4 @ £4. 5/.

Old Rails.—The market continues irregular, with prices for T's and Double Heads, c.i.f. New York, 60/ @ 65/.

Scrap.—The market is unchanged, with Heavy Wrought at 50/ @ 55/, c.i.f. New York.

Copper.—The market a little weaker. Chili Bars closing £39. 10/ @ £39. 15/, and Best Selected £45 @ £45. 10/.

Tin.—The market closes a little steadier, with spot and futures at £102. 15/ @ £103. 5/.

Tin Plates.—The market is firmer and 3d. higher on common Cokes. We quote:

Tin Plates, 10x14, 1st qual. Charcoal	17 @ 18
" " " " "	16 @ 18
" " " " "	14 @ 15/6
" " " " "	13/8 @ 14/6

Spelter.—The Market is steadier. We quote £14. 10/ @ £14. 12/6.

Lead.—We quote Common English £12. 5/.

Freights.—Steam freights from Glasgow to New York have advanced to 10/5, and Liverpool to New York 8/ @ 9/.

Financial.

Office of The Iron Age,
WEDNESDAY EVENING, July 6, 1887.

A short and uneventful week affords but scanty material for a commercial report, but the general drift is in favor of renewed activity at the close of the summer months. The temporary disturbance in commercial circles arising from the rupture of the wheat deal has given place to a more settled feeling and renewed confidence. The period of financial stringency looked for in connection with the July settlements has also passed by without serious embarrassment, but the course of the money market will be observed for some time to come with unusual interest, particularly on account of the low condition of the bank reserves. On Friday, July 1, holders of stocks were compelled to pay all the way from 6 to 51% for money to bridge over the holiday period extending from the close of business on that day to Tuesday, the rate closing from 7 to 8%. The really favorable feature is the improved aspect of the crops in the Northwestern wheat belt, where timely rains at a critical period brought welcome relief. Everywhere corn looks well, and in the South the cotton plant, now just approaching maturity, affords every assurance of an abundant yield. A large portion of the wheat crop in Southern Illinois has been already secured. The industrial situation improves, only trifling disaffection among workmen being reported in any direction. The adjustment of the wages question in the Western iron mills on a basis of 10% advance is among the latest settlements.

Reports of railroad earnings indicate active transportation on all the principal lines. The New York Central surplus for the quarter ending June 30 was \$1,360,000, a sum rarely if ever before equaled during a like period; Lake Shore's surplus for the half year was \$1,750,000, which was only equaled in 1879 and 1880; Michigan Central and Canada Southern make reports of like character, and yet these roads are said to have derived no advantage from the workings of the Interstate law.

The Stock Exchange markets early in the week recovered from the previous extreme declines caused by the crash in Manhattan elevated, but to-day there is a return of weakness, Manhattan dropping two points

to 117, and Western Union, New England and Pacific Mail were all lower. All through the week the attendance at the Board was light and little interest manifested, except by professional speculators. Saturday and Monday being holidays, transactions were naturally restricted. Quotations at the close are as follows: Canada Pacific, 59; Delaware, Lackawanna and Western, 133½; Erie, 31½; Kansas and Texas, 28½; Lake Shore, 97½; Michigan Central, 88; Manhattan Consol., 117; Missouri Pacific, 102½; Nashville and Chattanooga, 81½; New York Central, 109½; New York and N. E., 50½; New York, Susq. and West., 103½; Northwest, 118½; Oregon Navigation, 98; Pacific Mail, 43½; Pullman Palace Car Company, 151; R'd'g a. p. 56½; St. Paul 87½; St. Paul and Omaha, 50½; Union Pacific, 56½; Washburn and Western Union Tel., 76½; Louisville and Nashville, 61½; North. Pacific, 33½; St. Paul and Duluth, 81½.

United States bonds closed as follows:

U. S. 4½, 1891, coupon	109	@ 109½
U. S. 4½, 1897, coupon	128	@ 128½
U. S. Currency 6s, 1893	123	@ 123½
U. S. Currency 6s, 1896	123	@ 123½
U. S. Currency 6s, 1897	123	@ 123½
U. S. Currency 6s, 1898	123	@ 123½
U. S. Currency 6s, 1899	123	@ 123½

The general markets are uniformly dull. A squeeze in June wheat was settled on the basis of \$1.07. For spots, prices are in favor of the seller. Dry goods jobbers are awaiting the decision of the trunk line authorities respecting the reclassification of freights before making shipments for the fall trade. Pacific Coast tariffs, Eastbound and Westbound have mostly been extended beyond the date of expiration. Coffee is quiet and firmer, quotations nominal. Cotton spots active and ½¢ lower. India-rubber in moderate demand. Leather steady. Provisions are dull and easy, and stocks largely increased despite the loss of some 4,000,000 lb burned at Chicago. Ocean freights to Liverpool are generally higher.

The public debt statement for June shows that the debt decreased during the month \$16,852,725. For the entire fiscal year the decrease is \$109,707,646. The debt is now \$1,688,229,591 principal, and \$12,542,357 interest, making the total indebtedness \$1,700,771,948. Deduct cash in the Treasury and available cash items, and the net debt stands \$1,279,428,737. Since the 1st inst., when the 149th call for \$19,716,000 3% bonds matured, \$15,512,600 of the bonds have been redeemed by the Treasury Department. The expenditures so far this month exceed the receipts by over \$9,000,000, and there is every indication that the Treasury surplus will be reduced to about \$36,000,000 by the last-named date. The weekly bank returns show an increase of \$305,075 in surplus reserve, and loans were contracted \$1,931,100; deposits were down \$2,073,100. The balance at the Clearing House on Saturday was over \$11,000,000, being the largest in the history of the institution with one exception, that of July 2, 1879. The transactions on the last day of the week amounted to over \$200,000,000. The total Clearing House returns for 35 cities aggregate \$1,251,154,614, against \$1,008,999,364 in 1886. This makes the percentage of increase, as compared with last year, 23.9%, against a gain of 7.4% the previous week. The clearings outside of New York show a gain of 14.9%, against a gain of 26.6% the previous week. The total is \$377,510,286, against \$328,739,339 last year. The exhibit is a favorable one, both when compared with that of the previous week and with the one for the corresponding week of last year, nearly all the large prominent cities showing heavy gains. Omaha heads the list, the percentage of increase at that point amounting to 63.3%, followed by St. Paul, Wichita, Minneapolis, Indianapolis and Kansas City.

Rates for money are 6% for 60 to 90 days; four months, 6 @ 7%; sales of commercial paper are only nominal. The posted rates for bankers' sterling are \$4.84 @ \$4.85½. The market is dull and heavy. The Bank of England rate of discount is unchanged. Money is firm in London in consequence of gold exports to the United States and Germany, and the impending export to South America, which, if the movement continues, will involve a rise in the bank rate. According to the Custom-House report, the exports of specie from this port for the week were \$369,000 and the imports \$50,000, making the totals since January 1 \$9,970,000 and \$6,062,000 respectively, as against \$42,277,000 and \$6,000,000 for the corresponding period in 1886.

The imports of merchandise at this port during the past week were \$364,000 above those of the previous week, the valuation being \$9,570,575, making the total since January 1 \$236,005,000, against \$217,005,000 for the same time last year, and \$194,307,000 in 1886. The exports were valued at \$5,870,586, making a total since January 1 of \$151,069,000, as compared with \$158,841,000 for the same time last year. The items include 1,346,150 bushels of wheat, 6349 bales of cotton, 11,983,000 barrels of petroleum and 3,632,000 lb lard.

The business failures of the week include the large dry goods firm of John Slade & Co., of this city, who give preferences to the amount of \$202,110. The Mercantile Agency of R. G. Dun & Co. reports that for the first half of 1887 the failures in the United States are 4912 in number, as compared with 5156 for the same period in the previous year, showing a decline of 244. The liabilities were \$55,138,000, as against \$50,434,000 for the first half of the year 1886. The failures in Canada include liabilities for the first half of 1887, amounting to \$10,693,015, against \$5,591,697 for the corresponding period of 1886.

General Hardware.

The month opens with a comparatively small demand, but the condition of the market is regarded as exceptionally satisfactory, and the prospect for the season's trade is regarded as very good. Prices are without material change, and manufacturers are showing a commendable disposition in refusing to make concessions. The prevailing prosperity of the country at large, and the increasing consumption of goods are features that point to a good business in the near future.

NAILS.

The New York Nail market has shown some signs of improvement, largely because the low figures made by a few sellers for some time past have been withdrawn, and \$2 for carload lots is the lowest figure now quoted, with little or no cutting for second hands. We quote \$2 @ \$2.10 for carload lots, and \$2.10 @ \$2.20 for lots from store. A number of plans are being advocated in behalf of a pool, and there is much discussion of the revision of the extra list which is likely to be taken in hand at an early date.

BARB WIRE.

The market is quiet, with carload lots of Four-Point Galvanized at 4.10¢, 3 ton lots at 4.30¢, and 4.40¢ for smaller lots.

The Washburn & Moen Mfg. Company are reported to have suffered a serious check in sustaining their Barb-Wire patents in the United States Circuit Court at St. Louis on the 28th ult. The company had brought suit against the Freeman Wire Company for infringing the Burnell patent recently purchased from the Iowa Steel Barb Wire Company. The Freeman Wire Company alleged that the Washburn & Moen Mfg. Company and the Iowa Steel Barb Wire Company had entered into a conspiracy to test the Burnell patent in the courts. When these facts, based on affidavits, were brought before Judge Thayer, he refused to issue an injunction.

The assignee of Sherman & Marsh and Schnabel & Co., Barb Wire manufacturers, of Chicago, who failed some time ago, reports that every pound of the Barb Wire and plain Wire belonging to these bankrupt estates has been sold, and is now out of the market entirely. Thus an element which at one time threatened serious disturbance of regular prices has been happily removed without causing any trouble. The stock embraced about 1000 tons of Barb Wire and 5000 tons of plain Wire. The stock sold included the H.P. Nail Company's Wire, which was the subject of litigation. Although the company won their suit they concluded to forego their advantage, as the estates would have been tied up for an indefinite time, and a final settlement postponed to the annoyance of all parties. The two Barb-Wire plants are now offered for sale. One is located at Grand Crossing and one at Deering Station; both in the vicinity of Chicago. N. B. Judah is assignee in charge, and his office is in the Adams Express Building, Chicago.

MISCELLANEOUS PRICES.

A new list on Iron Wood Screws has been adopted by the manufacturers, and a copy of it is given above. The list for Brass Screws remains without change, as do also the discounts on both Iron and Brass Screws. A comparison of the new list with the old shows that a material reduction has been made in the list of prices of the smaller sized Screws. With the repeated and large advances which have from time to time been made in Screws, an opportunity was given for the importation of Screws of the smaller sizes, and of late some invoices of such were imported, with a prospect of such importation becoming a regular feature of trade. To correct this condition of things this new list is issued; but while it makes a reduction in the price of the small screws, it is to be observed that the manufacturers have covered themselves from diminished profits from this enforced concession, as corresponding advances have been made in the price of the larger sizes of Screws. On a representative order it is estimated that the price will be slightly advanced, and the aggregate of the list prices of the new list are about 5 per cent. in excess of the aggregate of the list prices of the old list. The prices at which the goods previous to this change were sold by the jobbers were, perhaps, slightly higher than those which had prevailed, the trade recognizing the firmness of the manufacturers' prices. The effect which the reduction in price on the small sizes will have remains to be seen.

J. C. McCarty & Co., agents for L. Coes & Co., and John H. Graham & Co., agents for A. G. Coes & Co., announce in a joint circular, dated July 1, a continuation of discount 55 per cent. on Coes' Genuine Screw Wrenches of either make. Mechanics' Wrenches made by L. Coes & Co., and similar quality by A. G. Coes & Co., will continue to rate at 10 per cent. less than the Genuine. The usual announcement in regard to the special discount of 10 per cent. on specified orders for 50 dozen for immediate shipment is also made. Terms, 90 days or 3 per cent. discount for cash in 10 days.

There is little change in the condition of the Steel Goods market, prices ranging substantially the same as a year ago. The manufacturers have recently been conferring, with a view to the adoption of some

measures to secure the realization of better prices, but without reaching any decision that promises to materially improve the market. The desirability of refusing to accept orders for a month or two, during which time some decision might be reached, was alluded to, and something of an effort was made in this direction, but the fact that orders are being accepted freely would indicate that the carrying out of this understanding was not found feasible.

Prices of Rope are low and irregular, and the market is regarded as decidedly weak. As the time for the termination of the combination between the manufacturers approaches, the impression seems to prevail that there will not be a renewal of it, but that after July 31 the association will come to an end. Some efforts are, however, being made for its continuance, and it is a question as to the outcome. In the meantime prices are lower.

The Tack market gives no indication of improvement, and on some lines lower prices are made by some of the manufacturers than were quoted a few months ago. There is also a good deal of irregularity in the quotations of the different companies, some being materially lower on certain goods than are others. The fact that there is a tendency toward the putting of short-weight goods on the market is also alluded to as one of the undesirable features of trade, and one that has some effect in explaining the quotation of some of the low prices. It will be well for merchants to closely scrutinize the weight of the Tacks purchased.

The manufacturers of the cheaper grades of Rubber Hose, Belting, &c., are feeling the effect of the advanced prices of Crude Rubber and Cotton Duck, and are accordingly announcing the withdrawal of former quotations, which are replaced in some cases by higher figures.

The demoralization of the market on Heavy Hammers and Sledges is referred to as a striking instance of what so frequently follows in the case of a broken combination. The market is very irregular and some aggressively low prices are made.

The associated manufacturers of Strap and T-Hinges have advanced the price, making the discount 65 and 10 per cent., instead of 70 per cent., as heretofore, with the usual extras for quantity and cash. A corresponding advance has not been announced by the manufacturers outside the association, and it remains to be seen whether or not the new discounts will result in stiffening the market price.

ITEMS.

The trade will be interested in the advertisement on page 15, in which the Eagle Company, Riverton, Conn., illustrate their Cannon's Patent Sleigh Shoe. It will be observed from the cuts there given that this is a dove-tailed grooved shoe, which is attached to the runners without the bolts passing through the shoe. The manner in which this is done is clearly indicated in the illustration. Advantages of this shoe, alluded to by the manufacturers, are that it is hardened to such a degree that a file will not make any impression on it, while it is at the same time warranted not to break. The ease with which it is fitted and fastened to the runner is also referred to, as well as the advantage that it possesses in running on bare ground or over stones or railroad tracks, with comparatively little adherence or resistance. The point that it will outlast several sets of ordinary shoes is also made. It is also stated that the cost of these Patent Shoes on a sleigh does not exceed the expense of the common ones.

Bolles, Kimball & Wilde, successors to B. Callender & Co., Boston, Mass., have taken the store No. 93 and 95 Pearl street, for a term of years, and removed there on the 1st inst. In the circular announcing this change of location they express the hope that by strict attention to business, and low prices for cash, to do a much larger business than their predecessors did. They allude to their policy of selling on short time as enabling them to take the benefit of all the discounts, which in turn they give to their customers, thereby making purchases cost their customers just that amount less than they would if sold on longer time.

Weir & Wilson, 14 German street, Baltimore, Md., have opened an office at 94 Chambers street, New York, with the Bradford Lock Works. They issue a circular giving a corrected list of the numerous factories for whom they are Southern and Southwestern agents. Their announcement in regard to their business will be observed on page 46.

Schenck's Adjustable Fire Brick Company, 94 Market street, Chicago, have purchased the entire control of the Westphal Patent Revolving Shot, Bolt and Screw Cases, and will hereafter be the exclusive manufacturers. Their purchase covers the Patents, Machinery, Tools and stock on hand. The transfer was made on the 27th ult. The new owners have the capital, energy and necessary business connections to enable them to properly push the sale of these Cases, and parties ordering them will now find shipments made promptly. These Cases are not made with drawers, but with compartments. The Bolt Case, for holding Carriage, Tire, Stove and Machine Bolts and Screws, Tape, Set Screws and Washers, contains 88 compartments. The Screw Case is made in three sizes, one holding from ¾ x 2 to 3 x 20, another to 2½ x 12, and

the third to 2 x 12. Only one compartment can be open at a time. Screws are not liable to be mixed, and no one can get into the Case except from behind the counter. The Shot Case is made in two sizes, one holding 12 bags and one 18 bags. It is ingeniously arranged, so that but one funnel is used and only one place to let Shot out. The cut-off is absolute in its work, stopping the flow of Shot immediately. All the Cases are strongly made of Iron, but present an ornamental appearance.

Henion & Hubbell, Chicago, Ill., have recently issued a discount sheet relating to Pumps, Wagonmakers' Tools, Butchers' Tools, &c., and to a variety of goods connected with these lines.

The James L. Haven Company, Cincinnati, Ohio, issue their net price list No. 120, which bears date June 25. It relates to Barrows, Bells, Chain Pumps, Jack Screws, Lawn Vases, Chairs, Settees, &c., School Desks, Sad Irons, Malleable Ox Shoes, Corn Shellers, Cider Mills, &c.

The Wyckoff Pipe Company, Williamsport, Pa., whose advertisement appears on page 15, allude to the desirability of their Wooden Water Pipe, which is made under Wyckoff's patent, and its suitability for Hardware dealers' trade. It is 1-inch bore, round, and coated outside. The low price at which it is sold is also referred to, as well as the fact that it finds ready sale among farmers for conveying spring water.

F. O. B.

For the purpose of ascertaining whether the trade understand the term f.o.b., as applied in the purchase of a bill of goods to signify that no charge is to be made for cases, or whether they regard it as applying only to cartage, we have addressed inquiries to a number of manufacturers and merchants. We give below the substance of some of the replies. It will be seen that they indicate a wide divergence of opinion. We shall be pleased to have a further expression from both manufacturers and merchants, that the exhibit of the trade's understanding of the term may be as complete as possible:

H. D. Smith & Co., Plantsville, Conn.—We understand f.o.b. to signify no charge for cases or cartage, unless in making quotations it should be specially stated that cases would be charged for—that is, no expenses upon the goods other than quoted.

Harrington & Richardson, Worcester, Mass.—As we understand f.o.b. it includes both cases and cartage.

Yale & Towne Mfg. Company, Stamford, Conn.—Our practice is that where a quotation is made f.o.b. we deliver the goods on board without charging for cases. If we proposed to charge for packing we should always so state in our proposal.

Bagnall & Loud Block Company, Boston, Mass.—We have always understood the term f.o.b. to mean goods free of any expense delivered on wharf or depot in city. No charge for cartage, cases or freight, as the terms might be agreed upon. We think this is the correct definition of what the term means, as generally understood by manufacturers.

Wheeler, Madden & Clemson Mfg. Company, Middletown, N. Y.—If our opinion f.o.b. means f.o.b. or it does not mean anything. We use the term frequently, but always qualify it by adding "with reasonable charge for packages." We do not hesitate in expressing our opinion that f.o.b. signifies no charge for packages or cartage.

HP Nail Company, Cleveland, Ohio.—The term f.o.b. means, as we understand it, Nails on board cars packed in the usual way for shipping and no charge for such packages.

Wolfe, Lane & Co., Pittsburgh, Pa.—We understand a quotation with f.o.b. attached to imply that no other charges will be added of any character.

Caruth & Byrnes Hardware Company, St. Louis, Mo.—Custom usually makes law. However, in naming prices f.o.b., it would imply no charge for packages or cartage.

Tucker & Dorsey Mfg. Company, Indianapolis, Ind.—Our understanding has been that the term f.o.b. only signified no charge for cartage or drayage, but your putting the question to us raises a doubt in our mind. We have never charged for crating or boxing. F.o.b. certainly means free on board the cars, and few goods can be carried to the cars without being held together by crating, boxing or tying. However, it is not an absolute necessity so long as the goods are complete in themselves, and our opinion is that a lawyer would decide crating to be only incident and not implied by the term in question.

Kennedy, Spaulding & Co., Syracuse, N. Y.—Refers only to cartage.

E. C. Atkins & Co., Indianapolis, Ind.—It is our opinion that the term f.o.b. of itself has no reference to charge for cases, but implies that the merchandise, of whatever value as standing in the store of the seller, is to be delivered on the cars without charge for carting. Regarding the charge for cases, packing, &c., we believe that in the absence of a specific contract custom would govern. Where a party was purchasing a line of goods for which packing or cases are usually charged, the term f.o.b. in the contract of sale would not signify that the purchaser should not pay for casing.

North Wayne Tool Company, Hallowell, Me.—We understand the term f.o.b., as applied in the purchase of a bill of goods, to signify that no charge is to be made for cases where goods are sold by the case and not subject to repacking, and that no charge is to be made for cartage.

Mast, Foss & Co., Springfield, Ohio.—We understand the term f.o.b., as applied to the purchase of goods, to signify that no charge is to be made for cases or cartage. When we quote prices on our goods f.o.b.

IRON WOOD SCREWS.

List of July 1, 1887.

Nos.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Inches	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.	Chs.
1/4	30	30	30	30	30	30	33	36	39																						
1/2	30	30	30	30	30	33	36	39	41	47	53																				
3/4	30	30	30	30	33	36	39	41	44	50	56	63	70																		
1					35	38	41	43	48	53	59	67	75	83	90	110	125														
1 1/4						44	47	51	56	63	69	77	86	96	105	120	135	160	185	210											
1 1/2							58	63	70	75	83	93	105	115	130	150	175	200	225												
1 3/4								75	80	85	95	105	120	130	145	165	190	210	245												
2									90	100	110	120	130	145	160	180	205	225	260	300	350										
2 1/4										115	120	130	140	155	170	190	215	235	280	335	380										
2 1/2											140	145	150	165	185	205	230	255	305	365	415										
2 3/4												165	170	180	200	220	245	270	330	400	455										
3													205	210	220	240	265	295	360	435	505										
3 1/4														250	260	270	295	325	390	475	565	685									
3 1/2															330	360	400	460	550	640	760										
4																	480	540	630	730	840										
4 1/4																		565	635	730	845	965									
5																			810	855	965	1100									
6																				1180	1330	1500	1670								

We always deliver without charge for cases or cartage, and if we quote f.o.b. New York City, or any other place, we deliver same to that place, but do not consider that we should allow any cartage at the other end of the line.

Edwin Hunt's Sons, Chicago, Ill.—Our understanding is that the expression f.o.b. precludes charge for either cases or cartage.

Bard, Reber & Co., Reading, Pa.—We understand by it that if goods are quoted at a certain price, f.o.b. that price will include all charges, boxes and cartage, unless these certain goods are uniformly sold by all manufacturers under a rule that boxes are charged at a uniform price, and so specified either in their catalogue or the purchaser notified at the time the contract or sale is made. Without any definite information we understand f.o.b. to mean no further costs, either for boxing or transportation.

Geo. Worthington & Co., Cleveland, Ohio.—If quotation was made to us f.o.b., we should understand that there would be no charge for cases. Otherwise the quotation would be with charge for cases, which is usually done if the party making the quotation expects pay for cases.

Losey & Co., Easton, Pa.—We understand f.o.b. to refer only to cartage.

Bostwick, Braun & Co., Toledo, Ohio.—We infer that the term f.o.b. applies to cartage only, and if cases are expected free, they should be mentioned.

McCune, Lonnis & Griswold, Columbus, Ohio.—Most emphatically to cases and cartage. A quotation of 60 per cent. f.o.b. means 60 per cent. free on board cars, which would not be so were cases charged.

Washburn Mfg. Company, Chicago, Ill.—We deem it incumbent on the house which sells goods f.o.b. at any particular point to deliver such goods at that point free from all charges of carting, packing and boxing.

Hamilton & Mathews, Rochester, N. Y.—We understand that the term f.o.b. refers only to cartage.

Wells & Nelligan Company, Chicago, Ill.—We should expect goods free of boxing and carting where bought f.o.b.

A. F. Seiberger & Co., Chicago, Ill.—We understand the term f.o.b. to mean cartage only.

Janney, Semple & Co., Minneapolis, Minn.—F.o.b. means no charge for either cases or cartage.

Kent Iron and Hardware Company, Wilmington, Del.—F.o.b. we take to mean no charge for cases.

Bindley Hardware Company, Pittsburgh, Pa.—Our understanding of the term f.o.b. is no charge for cases or drayage. Should a party mean only no drayage, then the term is ambiguous, and requires an interpretation, which could be avoided by saying no charge for cartage.

Hartman Steel Company, Beaver Falls, Pa.—We understand that the term f.o.b. signifies no charge for cartage, and has no reference to boxing. Some of our customers hold otherwise, and are, therefore, particular when quoting such goods as are boxed at the customer's expense to call attention to the charge for boxing.

Salem Wire Nail Company, Salem, Ohio.—We understand that a sale f.o.b. covers the cases, unless a charge for the cases is expressly provided for.

P. A. & S. Small, York, Pa.—We consider the term f.o.b. to mean free of charges for cases and cartage. We are aware that some understand it differently, and are glad you are making the inquiries, and trust it may tend to a definite understanding of the term.

New London Scythe Company, Scytheville, N. H.—We make no extra charge for cases.

G. & H. Barnett, Philadelphia, Pa.—As we understand the term f.o.b., it means delivery free, or without charge for carting, on board cars or boat in a given city or place. The charge for boxing is a matter of arrangement between buyer and seller, some manufacturers making this charge, others not, just as terms of sale call for.

W. & B. Douglas, Middletown, Conn.—We have always understood the term f.o.b., as used in the purchase of a bill of goods, to signify that the usual charges were to be made for the goods and putting them in shipping condition (that is, cases and casks to be charged), but that the delivery of the goods to the railroad station, steamboat, or f.o.b. in New York City, should cover freights from the factory and cartage in that city to the shipping point, either railroad,

vessel or steamboat. There can be no question that the commercial understanding is, that the usual charge for packages should be made, but freight charges and cartage should be free.

Enterprise Mfg. Company, Philadelphia, Pa.—Our answer to your inquiry is necessarily from the manufacturer's standpoint. Our shipments of boxed goods are of course made in original packages. It is not customary with us to charge for cases under any circumstances, and the term f.o.b. quoted by us would therefore imply that the goods were to be delivered on board vessel or at railroad depot without charge either for cases or cartage. We would not so understand it, however, from the jobber's standpoint. There it would mean free delivery at depot or on vessel, but we think the jobber would have the right to charge for cases, not original packages, unless previously understood to the contrary. We do not know to what extent cases are charged for by the Hardware trade, nor do we express any opinion as to whether or not they should be charged for.

Wire Goods Company, Worcester, Mass.—We understand the term f.o.b., applied to the purchase of a bill of goods, to signify that it is free of cartage and other transportation expenses in getting it on board the cars or steamer. We do not understand that it has any reference to cases, but that it refers to cartage alone. We always charge for cases at what they are worth. If ordinary packing cases will answer, they are charged at ordinary prices, but if goods are for export and must have cases lined with zinc, and strapped with iron and made airtight, we charge in proportion to the cost, and we have never seen any other equitable way to do in the matter of cases than to charge just what they cost. If goods are sold to a city customer and his porter calls for them and takes them away in a basket on his shoulders, we do not charge, but if we supply cases we do charge. We repeat that we understand the term f.o.b. to have no reference to cases. If we say f.o.b. here, we mean that we will see that the goods are put on board the cars or steamer without charge for that expense. If we say f.o.b. at the customer's city, we mean that we will stand the railroad freight as well as that city and there will be no charge for the transportation of the goods.

E. C. Stearns & Co., Syracuse, N. Y.—Only to cartage.

Old Colony Rivet Company, Kingston, Mass.—We do not understand that the term f.o.b. concerns the cases. The custom of the several trades determines that f.o.b. means simply delivered to the conveyance designated (cars, steamer, &c.) without charge for cartage or the other means of transportation.

American Tack Company, Fairhaven, Mass.—The term f.o.b. means free of cost for transportation, including cartage, to the place named.

E. D. Clapp Mfg. Company, Auburn, N. Y.—We understand the term f.o.b. in a quotation of prices to mean free on board, without charge for boxing or cartage. We are free to acknowledge, however, that this is not the view taken by everybody. We have just had a case where quotation was made "all goods boxed and delivered f.o.b. on cars," and yet the parties charged for crating the carriage, and insisted that the charge was legitimate and refused to take it off.

American Bolt Company, Lowell, Mass.—As we understand the term f.o.b. in our line of business, it means no charge for cases or cartage. Whenever we put prices f.o.b. it is with the above understanding. We think the trade generally understand it as we do; at least, goods in original packages are delivered at depot without charge for cases. In some lines of trade charge is made for packing when an assortment of various kinds is ordered, thus breaking original packages.

Alford & Berkele Company, New York.—F.o.b. we consider to mean no charge for cases.

J. Barton Smith Company, Philadelphia, Pa.—We consider f.o.b. as goods delivered free on board cars, including boxing and cartage, for if the goods must be boxed in order to insure safe delivery, how could they be put on cars without boxing, f.o.b.

Bemis & Call Hardware and Tool Company, Springfield, Mass.—We do not understand the term f.o.b. as applied in the purchase of a bill of goods to signify that no charge is to be made for cases.

Lane Bros., Poughkeepsie, N. Y.—It is our view that as some goods are cased, and some are not, and the term f.o.b. applied to both, that f.o.b. has reference to the handling of goods, and does not in any wise apply to cases or casing.

Smith, Lyon & Field, 139 Duane street, New York.—We consider that f.o.b. refers to cartage only.

Bigelow & Dowse, Boston, Mass.—Our understanding of the term f.o.b., as applied to the purchase of a bill of goods, signifies only free delivery on board cars or steamer at point mentioned. It has no reference whatever to charge of cases.

J. L. Stichter & Son, Reading, Pa.—We have always understood the phrase f.o.b. to mean free on board as to cartage only, with no reference whatever to cases.

Fred. J. Meyers Mfg. Company, Covington, Ky.—Our understanding of the term f.o.b. is that goods are to be delivered free on board cars at shipping point, without extra charge for casing or cartage.

Goodell Company, Antrim, N. H.—We have always understood the terms f.o.b., as applied to the purchase of a bill of goods, to mean that there would be no charge for cartage from factory or store to railroad, but we do not understand that it interferes with our making a charge for cases when they are necessary.

Butterfield & Co., Derby Line, Vt.—We have always understood the term f.o.b. to mean goods delivered on board cars free of expense to purchasers.

Henry Brooks & Co., Boston, Mass.—We do not consider that the term f.o.b. has any reference to the charge for cases.

F. O. North & Co., Boston, Mass.—Cartage only.

Frye, Phipps & Co., Boston, Mass.—F.o.b. means generally no case or cartage, but prices free on board cars. Still, were we to make a special trade with a man who always charged case, we should mean no carting, and so specify case charged, no carting.

Quackenbush, Townsend & Co., New York.—We understand f.o.b. to mean goods purchased are delivered on cars free. The purchaser pays the freight. Nothing to do with cases.

W. P. Townsend & Co., New Brighton, Pa.—We understand that no charge is to be made for cartage.

W. Bingham & Co., Cleveland, Ohio.—We understand the term f.o.b., as applied to the purchase of goods, to mean free on board cars without any charges whatever, either for cases or cartage.

A. F. Pike Mfg. Co., Pike Station, N. H.—We understand the term f.o.b. to mean no charge for cases and cartage.

Southington Cutlery Co., Southington, Conn.—We make no charge for cases or packages on any of our goods. F.o.b. is free on board cars at Southington.

L. Coes & Co., Worcester, Mass.—We understand the term f.o.b., as applied to the purchase of a bill of goods, to mean that no charge is made for cartage, and that it has no reference to cases. We have, however, never made a practice of charging for cases when goods were shipped from factory.

Liggett Spring and Axle Co., Pittsburgh, Pa.—We understand f.o.b. to refer only to free on board—that is, no charge for cartage. Our custom is to charge and collect for packing cases, or a ship loose.

C. E. Jennings & Co., New York.—We understand that the term f.o.b. refers to cartage only.

Gautier Steel Department, Cambria Iron Co., Johnstown, Pa.—Our understanding of the term f.o.b., as applied to goods, is simply that they are to be delivered free on board cars at place of shipment. The question of cases is a separate one, which has to be settled by the custom of special trades, and does not enter into consideration when 'f.o.b.' is used. It is customary for us to specify whether there is to be any extra charge for boxing or not.

Wm. H. Haskell Company, Pawtucket, R. I.—It depends upon the custom in the line of goods bought. In our line of goods we make no charge for cases, and f.o.b. refers entirely to cartage and freight charges, and has no reference whatever to cases.

A. Field & Sons, Taunton, Mass.—We understand the term f.o.b. to refer to cartage only—i. e., if we deliver f.o.b. Taunton, we deliver on cars at Taunton f.o.b., or free on board, is free of cost for freight or carting to the point on board

where we promise to deliver. Referring to the charge made for cases, however, would say that we do not, nor are we aware that any tack manufacturer makes any charge for regular quality of cases when goods are put up the regular way.

Penfield Block Company, Lockport, N. Y.—We have always taken f.o.b. to include no charge for cases.

Port Chester Bolt and Nut Company, Port Chester, N. Y.—With us the term f.o.b., as applied to the sale of a bill of goods, implies that there are to be no extra charges for cartage, or anything else over the price at which the goods are sold.

Holmes, Booth & Haydens, New York.—F.o.b. simply means that the seller delivers the goods on board cars or boat without any charge to the consignee. It has nothing to do as to the price of goods or as to charges for cases.

Imports.

The imports of Iron and Steel, Hardware, Machinery, &c., at this port from June 28 to July 2 inclusive were consigned as follows:

Iron and Steel.	Tons.
Pig Iron: Naylor & Co.	410
Thos. J. Pope & Bro.	200
G. W. Stetson & Co.	100
C. L. Perkins	1,575
W. B. Ellis	50
James Williamson & Co.	20
A. Milne & Co.	20
W. H. Walbaum & Co.	1,950
Dana & Co.	500
Spiegelberg & Co.	1,151
Crocker Bros.	9
Dana & Co.	176
J. Abbott & Co.	901
Geisenheimer & Co.	25
Old Iron Rails: Naylor & Co.	100
Dana & Co.	100
Thos. J. Pope & Bro.	300
Wire Rods: Naylor & Co.	1,815
E. S. Wheeler & Co.	1,344
J. A. Roehling & Sons	416
Cary & Moen	37
J. Abbott & Co.	69
Belcher & Parks	25
R. H. Wolff & Co.	151
Dana & Co.	383
A. R. Whitney & Co.	25
Iron Screw Rods: American Screw Co.	80
Iron Bars: Naylor & Co.	125
J. Abbott & Co.	3
Gustav Lundberg	288
Steel: R. H. Wolff & Co.	20
J. Abbott & Co.	3
W. F. Wagner	11
A. W. Power	4
Belcher & Parks	1
Steel Bullets: Naylor & Co.	280
J. Abbott & Co.	492
Dana & Co.	1,348
Steel Sheets: R. F. Downing & Co.	122
Dana & Co.	5
Steel Rails: E. J. Nichols	2,000
G. H. Nichols	321
F. J. Kennedy	240
Steel Bars: Naylor & Co.	50
R. F. Downing & Co.	6
Steel Forgings: Thos. Prosser & Son	130
Sh. of Iron: F. B. Codrington & Co.	25
Rivet Rods: Naylor & Co.	50
Union Bridge Company	14
Gustav Lundberg	191
J. Abbott & Co.	320
R. F. Downing & Co.	17
Crop Ends: Dana & Co.	100
Scrap Iron: Jos. Eward & Co.	30
J. Abbott & Co.	105
Old Iron & Steel Plates: Henderson Bros.	51

Tin Plates.	Boxes.
Naylor & Co.	2,810
Phelps, Dodge & Co.	12,383
Brace & Cook	3,404
Pratt Mfg. Company	3,896
F. B. Codrington & Co.	3,463
L. F. Cort & Co.	1,601
Henry Whitehead & Co.	853
R. Crooks & Co.	3,570
Dickerson, Van Duzen & Co.	7,511
S. Shepherd & Co.	1,661
E. S. Wheeler & Co.	3,877
A. A. Thomson & Co.	2,574

Metals.	Pounds.
Tin: Naylor & Co.	232,535
Phelps, Dodge & Co.	168,075
J. David & Son	57,157
N. Corwith & Co.	25
Spelter: Naylor & Co.	55,995
Ladenburg, Thalmann & Co.	50,000
Lead: Ladenburg, Thalmann & Co.	321,100
Antimony: Hendricks Bros.	34
Edw. Hill, Son & Co.	300

Hardware, Machinery, &c.

Barclay & Co., Machinery, cs., 2
Baur, C. M., Vorn, cs., 7
Baker, Carl F., Mdee., cs., 5
Baker, Hermann & Co., Hardware and Cutlery, cs., 19
W. Mdee., cs., 10
Carr, G. W., Machinery, pgs., 2
Castle, S. A. & Co., cs., 14
Dickhoff, John, cs., 8
Dolge, Alfred, Mdee., cs., 2
Dreyfus, B., Machinery, cs., 2
Ely & Wray, cs., 1
Field, Alfred & Co., Mdee., cs., 1; Guns, cs., 1
Lesen, H. & D., Arms, cs., 28
Folsom, H. & D., Arms, cs., 28
Graef Cutlery Co., Cutlery, cs., 14
Hartley & Graham, Arms, cs., 14
Havemeier & Co., Machinery, cs., 65; pcs., 8
Jonay, J. H., pgs., 4
Stoves, pgs., 14
Junger, F. W. & Co., Mdee., cs., 12
Kastor, A. & Co., Mdee., cs., 9; Cutlery, cs., 6
Korting Gas Engine Co., Machinery, cs., 22
Keller, T., box, 1
Lesen, H. & D., Arms, cs., 2
Lau, J. H. & Co., Arms, cs., 3
McCoy & Sanders, cs., 3; Chains, cs., 9
Moore's Sons, J. P., Arms, cs., 17
Murphy, Alex. & Co., cs., 4
Rael Mfg. Co., Machinery, cs., 12
Taylor, Theo., Mdee., cs., 5
Schroeder, C. F. & Co., Machinery, cs., 1
Schloss & Co., Old Machines, cs., 2
Schwenning, Duly & Gates, Arms, cs., 2; Mdee., cs., 5
Sheldon, G. W. & Co., cs., 3; Machinery, cs., 16; pcs., 6
Smyth, Jas. P., Machinery, cs., 1
The Zylonite Co., Machinery, cs., 1
Van Nest, A. B., cs., 3
Williams & Rankins, Machinery, cs., 1
White, John S., Machinery, cs., 29
Ward, Asbline, Cutlery, cs., 1
Wiebusch & Hilger, Arms, cs., 19, cs., 3; Cutlery, cs., 1
Wiegand, Th., Machine Posts, cs., 2
Witte, John G. & Bro., Cutlery, cs., 5
Young, J. M. & Co., crates, 3
Order of cs., 11
Machinery, pgs., 15; Machinery, pgs., 3; Oil Stoves, pgs., 23; Machinery, cs., 11

WHOLESALE METAL PRICES, JULY 6, 1887.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢; provided that no bar iron shall pay a less rate of duty than 35¢. Sheet, 11-10¢ to 15-10¢. Band, Hoop and Scrolled, 1¢ to 1-4-10¢. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ to 14¢.

Standard American Pig Iron.

Foundry No. 1 X..... 21.50 @ 21.50
Foundry No. 2 X..... 20.50 @ 20.50
Gray Forge..... 19.00 @ 19.00

No. 1 Scotch Pig Iron.

Carnegie..... 22.75 @ 22.75
Coltess..... 22.00 @ 22.00
Shotts..... 21.75 @ 21.75
Glasgow..... 20.50 @ 20.50
Gartshore..... 21.00 @ 21.00
Langdon..... 22.00 @ 22.00
Sumner..... 21.50 @ 21.50
Dunellington..... 20.50 @ 20.50
Winton..... 20.00 @ 20.00
Ulyde..... 20.00 @ 20.00

Rails.

Steel, at Eastern mills..... 38.00 @ 40.00
Old Rails, Ts..... 21.50 @ 22.00

Scrap.

Wrought, 1/2 ton, from yard..... 22.50 @ 23.00
Common Iron:
3/4 to 2 in. round and square..... 2.30 @ 2.30
1 to 2 in. 3/4 to 1 in..... 2.30 @ 2.30

Bar Iron from Store.

Common Iron:
3/4 to 2 in. round and square..... 2.30 @ 2.30
1 to 2 in. 3/4 to 1 in..... 2.30 @ 2.30
1 to 6 in. 3/4 to 1 in..... 2.30 @ 2.30
1 to 6 in. 1 1/4 to 1 1/2 in..... 2.30 @ 2.30
Rods—1/2 and 1 1/2 in. round and sq..... 2.30 @ 2.30
Bands—1 to 6 in. 1/2 to 1 1/2 in..... 2.30 @ 2.30
Burdens' "H. B. & S." Iron, base price..... 3.50 @ 3.50
price..... 3.00 @ 3.00
Norway Rods..... 3.00 @ 3.00

Sheet Iron from Store.

Common American Cleaned.
10 to 15..... 2.30 @ 2.30
17 to 20..... 2.30 @ 2.30
21 to 24..... 2.30 @ 2.30
25 and 26..... 2.30 @ 2.30
27..... 2.30 @ 2.30
28..... 2.30 @ 2.30
29..... 2.30 @ 2.30
30..... 2.30 @ 2.30

Galvanized 16 to 20..... 4.00 @ 4.00
Galvanized 25 to 30..... 5.00 @ 5.00
Galvanized 35..... 5.00 @ 5.00
Galvanized 27..... 5.00 @ 5.00
Galvanized 28..... 5.00 @ 5.00
American Russia..... 5.00 @ 5.00
American Cold Rolled B. B..... 5.00 @ 5.00

Iron Wire.—(See Wire.)

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 1¢ per lb., 35¢ ad. val.; valued above 1¢ and not above 10¢ per lb., 25¢ ad. val.; valued above 10¢ per lb., 15¢ ad. val.; cold hammered or polished, in any way in addition to ordinary hot rolling, 15¢ ad. val. in addition to above; Steel Circular Saw Plates, 1¢ ad. val. in addition to the above.

American Cast Steel.

For American Steel see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes 3/8 to 3 inches, net..... 10 @ 14¢
Adamantine Shoes and Dies..... 8 @ 8¢
Magnet Steel..... 14 @ 14¢

English Steel.

Best Cast..... 14 1/2 @ 15¢
Extra Cast..... 16 @ 17¢
Circular Saw Plates..... 16 @ 16¢
Swaged Cast..... 16 @ 16¢
Best Double Shear..... 16 @ 16¢
Blister, 1st quality..... 16 @ 16¢
German Steel, Best..... 16 @ 16¢
2d quality..... 16 @ 16¢
3d quality..... 16 @ 16¢
Sheet Cast Steel, 1st quality..... 16 @ 16¢
2d quality..... 16 @ 16¢
3d quality..... 16 @ 16¢

TIN.—Duty: Plates, Sheets, Tagger and Terms, 1/2¢ per lb.; Bars, Block and Plate free.
Best..... 24 1/2 @ 24 1/2¢
Strait..... 24 1/2 @ 24 1/2¢
English..... 24 1/2 @ 24 1/2¢
Bar..... 25 @ 25¢

Charcoal Tin Plates.

C 10x14 225 sheets..... 6.00 @ 6.87 1/2
C 12x12 225 sheets..... 6.00 @ 6.87 1/2
C 20x28 112..... 10.35 @ 14.75
C 10x14 225 sheets..... 6.00 @ 9.37 1/2
X 12x12 225 sheets..... 6.00 @ 9.37 1/2
X 14x20 112..... 6.00 @ 9.37 1/2
D C 14x27 100..... 6.00 @ 7.25
D X 18x27 100..... 6.00 @ 7.25
For each additional X add..... 1.25 @ 2.25

Coke Tin Plates.

Best..... 4.50 @ 4.50
Ordinary..... 4.50 @ 4.50
C 10x14..... 4.50 @ 4.50
C 12x12..... 4.50 @ 4.50
C 20x28, gutters, 225 sheets..... 9.00 @ 9.00
C 20x28 112 sheets..... 9.00 @ 9.00

Tonne Plates.

Prime Char. 2d. quality..... \$18.25
C 14x20 M.F. 25.50..... 6.50
C 14x20 Old Process..... 18.25
C 20x28..... 4.37 1/2 @ 4.37 1/2
C 14x20..... 4.37 1/2 @ 4.37 1/2
X 14x20..... 8.50 @ 8.50
X 20x28..... 8.50 @ 8.50
X 20x28..... 11.00 @ 12.00

Tin Boiler Plates.

1XX 14x26, 2 sheets for No. 7, 112 sheets..... \$12.00
1XX 14x28, 2 " " No. 8..... 13.00
1XX 14x31, 2 " " No. 9..... 13.00

COPPER.—Duty: 1/2¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.
Ingot, Lake..... 10 @ 10¢
Ingot, Baltimore..... 10 @ 10¢
Ingot Anchor..... 10 @ 10¢

Cold Rolled Sheet.

6 oz. per square foot and heavier..... 1/2¢ @ 1/2¢
4 and 15 oz. per square foot..... 2 1/2¢ @ 2 1/2¢
12 and 13 oz. per square foot..... 2 1/2¢ @ 2 1/2¢
10 and 11 oz. per square foot..... 2 1/2¢ @ 2 1/2¢
Sheets, one side, 10, 12 and 14 x 48..... each, 8¢
Sheets, one side, other sizes..... each, 15¢
For tinning both sides, double the above prices.
For tinning boiler sizes, 9 in. 14 x 50..... each, 12¢
For tinning boiler sizes, 8 in. 14 x 50..... each, 12¢
For tinning boiler sizes, 7 in. 14 x 50..... each, 12¢

Sheathing Copper. (14 x 48.)

Hot Rolled..... 18¢ @ 18¢
Cold Rolled..... 19¢ @ 19¢
14 oz. and up to 16 oz., per lb..... 19¢ @ 19¢
2 oz. and up to 14 oz., per lb..... 20¢ @ 21¢
Tinning, 6 cents each.

Copper Bottoms.

Pits and Flats, 14 oz. and upward..... 21¢ @ 21¢
Pits and Flats, 12 oz. and upward to 14 oz..... 22¢ @ 22¢
Pits and Flats, 10 oz. and upward to 12 oz..... 23¢ @ 23¢
Circular less than 8 in. diameter, 2¢ ad. val. additional.

Netell's Patent Plated Copper.—Net.
14x20..... 14x20
14 and 16 oz. and heavier 2¢ By the case..... 20¢ @ 20¢
12 oz. and lighter..... 30¢ @ 30¢

7 in. 14x50, 8 in. 14x50, 9 in. 14x50.

and 16 oz. and heavier 2¢ By the case..... 20¢ @ 20¢
And all sizes not over 20 in wide..... 24¢ @ 24¢
14x48 and 30x60..... 31¢ @ 31¢
16 oz. and heavier..... 34¢ @ 34¢
Finished Brass same price as Plated Copper.

Copper Wire.—(See Wire.)

Yellow Sheathing Metal, 1/2¢..... 18¢ @ 18¢
BRASS AND GERMAN SILVER.
Brown & Sharpe's Gauge the Standard for Metal;
Old English Gauge the Standard for Wire;
Bass Manufacturers' Price List, January 17, 1884..... 18¢ @ 18¢

LEAD.—Duty: Pig, 32¢ 100 lb; Old Lead, 24¢ 100 lb; Pipe and Sheet, 34¢ 100 lb.

Pig..... 4.85 @ 5¢
Bar..... 4.85 @ 5¢
Pipe..... 4.85 @ 5¢
Block Tin Pipe..... 15¢ @ 15¢
Tin Lined Pipe..... 15¢ @ 15¢
Sheet..... 15¢ @ 15¢
Shot, 30 bag, 25 lb..... Drop, \$1.40; Buck, \$1.65
Chilled Shot, 30 bag, 25 lb..... \$1.65
ANTIMONY.
Hallett's..... 74 @ 9¢
Cookson..... 94 @ 10¢

SPELTER.—Duty: Pigs, Bars and Plates, \$1.50 100 lbs.

American, cash..... 47¢ @ 47¢
Bergenport..... 47¢ @ 47¢
ZINC.—Duty: Pig or Block, \$1.50 100 lbs.
Sheet, 24¢ 100 lb..... 64¢ @ 64¢
900 lb casks..... 64¢ @ 64¢
Zinc—Open..... 10¢ @ 10¢
Zinc Tubing..... 10¢ @ 10¢

Zinc Tubing.—Dis. 25¢.

Plain..... 27¢
Fancy..... 33¢
Scotch and Extra Patterns..... 36¢

RABBIT METAL.

N. P. U..... 6 1/2 @ 2¢
X..... 10¢
J. B..... 30¢

WIRE.

Market Wire.—Put up in 65 lb bundles.
Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10 11 11 1/2 13 1/2 14 1/2 15 1/2 16 1/2 17 1/2 18 1/2
Bright Market Wire..... 67 1/2 @ 67 1/2¢
Charcoal..... 67 1/2 @ 67 1/2¢
Bale Wire, Nos. 7 to 12..... 67 1/2 @ 67 1/2¢
Annealed Market Wire..... 67 1/2 @ 67 1/2¢
Fence Wire, Nos. 8 to 12, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 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THE WEEK.

Of all the ports in the United States, San Francisco leads in the proportion of American tonnage used in its foreign trade. The last report of the Bureau of Statistics for the fiscal year ending June 30, 1886, gives the proportion entered at the following ports:

	American.	Foreign.
Baltimore.....	45,799	475,671
Boston.....	251,382	922,176
New Orleans.....	56,917	616,642
New York.....	947,256	4,111,982
Philadelphia.....	217,544	997,517
San Francisco.....	429,730	350,966

Hence San Francisco has about one and three-quarter times greater American tonnage than foreign, while all the rest have the foreign from over four to nearly twelve fold of the American. The reason of this preponderance is traceable in part to the large number of American steam vessels and the comparatively few foreign, something the reverse of what is found on the Atlantic Coast.

A new tin pan focused the rays of the hot sun on Thursday last, and the dwelling of J. M. Willard, of Brocton, Mass., where the pan was set outside to dry, caught fire and was burnt to ashes.

Three of the bribed aldermen of 1884 are in Sing Sing Prison, one is insane, three have saved themselves by turning State's evidence, three are fugitives from justice in Canada, one is in Germany and two are dead. This disposes of 13 of the 22 who voted for the Broadway franchise. The remaining nine are in this city, under indictment and on bail. Of the four indicted bribe-givers Sharp, the leader, is now convicted, Foshey is dead and Kerr and Richmond await trial.

Gen. Charles J. Paine's new steel sloop Volunteer, which has been built as a possible defender of the American Cup in the approaching race with the Scotch cutter *Thistle*, was successfully launched on Thursday from the yard of her builders, Pusey, Jones & Co., at Wilmington, Del. The keel was laid no longer ago than May 16. The dimensions of the yacht are as follows: Length over all, 107 feet; on water line, 86 feet; extreme beam, 23 feet 2 inches. The new boat is 7 feet longer than the *Mayflower* over all but only 1 foot on the water line, and she is three inches less beam and has 6 inches more draft. Her keel is made of steel plates, three-quarters of an inch thick; the yacht frames are $\frac{1}{8}$ inch in thickness. They are angular in form, 3 x 2½ inches, and are placed 21 inches apart from center to center. The reverse frames are of ¼-inch metal and measure 2½ x 3½ inches. The plates are all of steel, and are graded to suit the streaks to which they are attached, those below the water line being ½ inch and those above ¼. All bolts are countersunk, and their ends trimmed off with a cold chisel in order to make a perfectly smooth exterior. The new boat is built upon entirely different lines from those upon which the *Mayflower* was constructed, and her appearance while on the stocks was entirely at variance with the orthodox ideas of the average yachtsman.

Electricity is gradually making inroads upon the old-time methods of horse transportation in our principal cities. In New York last week a very successful trial trip was made by electricity as the means of propelling surface railroad cars on Fourth avenue. The car was driven by the Julian motor with Julien storage batteries from Thirty-second street to the Grand Central depot at Forty-second street in very fast time. The car was then reversed and proceeded down town and reached the City Hall in about 22 minutes. The Brooklyn City Railroad Company have secured the consent of property owners representing \$6,000,000 worth of property for the change of their next motive power from horses to a cable road or to electricity. A practical test of an ordinary street car propelled by stored electrical energy, given by William Wharton, Jr. & Co. in Philadelphia last week, and is favorably noticed by the local editors. The experiment was demonstrated on a circular track of 1050 feet, the car at times containing as many as 35 passengers. The motive power consists of an electro-motor and 80 small cells representing the storage battery concealed beneath the seats.

The improvement of the water front in New York City, under the auspices of the Dock Board, makes slow progress, much embarrassment being experienced by the authorities in obtaining title to property held by private owners. Notwithstanding the great cost of the completed section bounded by Canal street on the south and Ferry street on the north, the revenues of the city arising therefrom amount to \$250,000 in rentals, or about one-fifth of the total derived from wharves and piers. One difficulty not long since overcome was the want of money. As long as the sinking fund was reckoned a part of the municipal debt no more bonds could be issued by the Dock Department for new constructions without exceeding the limitations of the city debt prescribed by law, but the courts having removed this supposed limitation money can be obtained upon drafts authorized by the Sinking Fund Commissioners.

A railroad soon to be built through the timber region of Maine will enable passengers to breakfast in Boston and take their supper in Quebec, the time of transit being not over 10 hours. It will be in connection with the Canadian Pacific Railroad, passing

through Moose River Village, and where it is expected the Quebec Central will terminate. The timber lands will be made much more valuable.

A. A. Talmage, vice-president and general manager of the Wabash Railway, died suddenly last week from strain and overwork occasioned by great Southwestern strike 15 months ago, the causes being similar to those which terminated the career of Vice-President Hoxie. His business life commenced in a wholesale hardware store in Dey street, New York.

Northern capitalists are investing heavily in pine lands in Southern Alabama.

The Superintendent of the Philadelphia Manual Training School, in a public address last week, spoke of the institution as having reached a stage promising permanent success, and said he was receiving almost daily applications from all parts of the country asking for instructors for similar schools that are being organized. The lack of trained instructors was seriously felt in developing manual instruction.

The new Pennsylvania law providing for the semi-monthly payment of wages will take effect in a few days, but it is said that the laboring men will have a struggle to enforce it. Many of the coal operators claim that the law is unconstitutional, and only a few have signified their intention of complying with it.

The bidders for constructing the new timber dry-docks authorized by the last Congress are Coffy & O'Connell, of Brooklyn, for the dry-dock at the Brooklyn Navy Yard at \$525,000, and I. F. Simpson & Co. for the two docks at Brooklyn and Norfolk at \$1,061,000. Commodore Harmony, Chief of the Bureau of Yards and Docks, will award the contracts.

The Chief Engineer of the Water Department in this city gives it as his opinion that Jerome Park will probably be the site of the new reservoir. The reservoir will have a capacity of 2,000,000,000 gallons of water, of which 700,000,000 gallons will be used daily in supplying the annexed district, and 250,000,000 in supplying New York City. It is thought that \$3,000,000 will buy the necessary 70 acres. The commissioners appointed to inspect the new aqueduct have finished their task, and the result is officially submitted. When the great work is completed they say its capacity will be 320,000,000 gallons per day, but 70,000,000 gallons of this will be taken off at the reservoir for the supply of the annexed district, leaving 250,000,000 gallons to be carried to the city proper. Of this one-half will be delivered to the "stopped" pipes above the reservoir, which are to supply the part of the city above Ninety-fifth street, and the other half will be assigned to the district below that point.

The New York and New England Railroad Company are said to have authorized improvements that will cost \$3,000,000.

The absurdity of the law prohibiting the bringing to this country of persons under contract to perform labor has been twice illustrated recently. In one case skilled workmen for silk manufacturing were brought over under an agreement to pay their passage and allow them to work it out afterward, but this brought the case under the law and they had to be sent back. Again, four zinc smelters arrived from Wales, having been engaged to work at Pulaski City, Va., under a verbal agreement, and their passage having been paid by the agent of their employers, Collector Magone was obliged to decide that they could not be landed.

The Halifax Sugar Refinery, in Nova Scotia, representing an investment of \$750,000, was sold at auction a few days ago for \$190,000. The Dominion protection laws sometimes fail to protect.

The Morris and Essex Railroad Company resist the claims of the State of New Jersey for alleged arrears of taxes, amounting to \$1,000,000, as having no foundation in law.

The pack of canned fruits in California this year is expected to be 25 to 30 per cent. more than in 1886.

The condemned schooner, *Silliman*, will be used by the War Department at Washington to test the power of the dynamite gun, and representatives of the several European powers will have an opportunity to witness the experiment of blowing her up.

The total arrivals of vessels at New York from foreign ports during the month of June are not quite up in point of numbers to the arrivals of June, 1886, there being a falling off in the smaller classes of sailing vessels, probably due to the fishery disputes, but of steamers there is an increase as compared with several former years. The total arrivals of all classes is 580; of steamers, 215; of ships, 124; barks, 139.

Fifty-two of the most prominent Italian business men in the city met at the office of the Italian Consul and formed themselves into an association that will be known as the Italian Chamber of Commerce.

Influenced by cheaper wheat the Minneapolis flouring mills are pressed with business, turning out 21,000 barrels of flour daily.

A partial revelation of the affairs of the mammoth "American Cotton Seed Oil Trust" was made at the annual meeting in this city last week. The financial statement

submitted shows the total amount of outstanding certificates to be \$41,706,000, which, it is claimed, represented the mills owned by the Trust and the improvements made. The earnings for the past year aggregated \$2,439,720 or about 5 per cent. on the capitalization. On this showing a yearly dividend of 4 per cent. was declared. The Trust has \$750,000 on hand and products unsold valued at \$3,378,660.

Nathaniel M'Kay, of New York, claims that the United States Inspectors of Steam Vessels have authority under the laws of Congress to prevent the overloading of foreign steamers sailing from this port.

Mayor Hewitt has appointed Morgan J. O'Brien Counsel to the Corporation in place of E. Henry Lacombe, who resigned the position to go on the bench of the United States Circuit Court for this district.

Iowa jobbers and manufacturers from all parts of the State were represented in convention at Dubuque, June 28, a special object being to see if favorable rates of transportation for freight cannot be obtained under the Interstate law.

Henry Winsor & Co., the owners of several steamship lines plying between Philadelphia and the different New England seaports, have ordered the building of a 2000-ton steamer for the coal-carrying trade between that city and Boston. The new craft will have powerful engines, in order to tow coal barges. The barge *Lone Star*, formerly a Morgan Line steamship, which was partially destroyed by fire in New York, has been purchased by Winsor & Co. for a similar purpose.

The National Federation of Trades Councils, in session at Chicago, adopted the following preamble to the proposed constitution: "This organization shall be known as the National Building Trades Council of the United States, and shall be composed of delegates from such building trades, federations, and organizations as recognize its jurisdiction and subscribe to its constitution. The objects of this council are to assist in the organization of the journeymen workers of the building trades; the federation of such trade organizations into building trades, councils, and central bodies in each locality of the United States; to create a bond of unity between the wage-working builders, and to aid by counsel and support all legitimate modes for the betterment of the condition of members of the building trades."

It is said that not a single vessel for freight purposes is building on the Canadian side of the lakes, while yards at Cleveland, Detroit, and Buffalo are crowded with work. Buffalo editors think the Canadians have discovered that the natural route from the Northwest is through Buffalo to the American seaboard.

Immigration at this port is undiminished. The arrival of aliens in unusual numbers is noticed not only in New York, but is common to all the leading ports on the Atlantic seaboard, so that the immigration for the year 1887 promises an extent that has been rarely paralleled. The Superintendent at Castle Garden estimates the number of aliens who will land during the year at no less than 400,000. The arrivals at this port for June were 46,580, as compared with 35,752 for the corresponding month last year, showing an increase of 10,828. This makes a grand total since January 1st of 205,000, against 142,000 for the same time in 1886. Despite this increase, the demand for agricultural laborers was never more urgent than now. The percentage of skilled mechanical labor that comes into this port is very small, and apparently on the decline.

The Erie Canal is a vigorous competitor with the railroads in grain transportation. The shipments from Buffalo for the season thus far are 15,200,000 bushels, compared with 12,500,000 bushels last year, and by rail 12,293,000, against 9,000,000 bushels in 1886.

Taxes in Brooklyn will be higher next year. The total expenditures under the various appropriations will be \$8,036,000, an increase of more than \$1,000,000 over the present year. Allowing for an increase of \$25,000,000 in the assessed valuation of taxable property, the rate for the ensuing year will be between \$2.72 and \$2.75 per \$100 of valuation. Last year the rate was \$2.65.

An important suit relating to merchant appraisers' fees was decided by Judge Wallace, of the United States Circuit Court, last week, in the case of Iselin, Neaser & Co., of this city, against the Collector of the Port, to recover a penalty for exacting from the plaintiff a fee to cover the compensation of a merchant appraiser on reappraisal. The case was appealed by the Government from the United States District Court to the Circuit Court, and the decision of the lower Court in favor of the importing firm was reversed, Judge Wallace holding that although such an exaction is illegal the merchant has no remedy where a certificate of probable cause is granted. This decision, in effect, covers over 80 similar pending suits against collectors in this district to recover penalties aggregating about \$500,000.

The pool of wall paper manufacturers, formed seven years ago, has ended in a failure to renew the agreement. There are about 35 wall paper manufacturers in the United States, situated mainly in New York, Philadelphia, Brooklyn and Buffalo. Of these, 16 were regularly in the pool and six conformed to its requirements in every particular except the pooling of profits. Strenu-

ous efforts have been made by some of the pool houses to renew the pool agreement for another period, but some of the very largest houses determined that as the pool could only be of benefit to them unless joined by substantially all the manufacturers, they would not renew their agreement unless all the important outsiders came in, and this the latter refused to do. Now, it is every man for himself. A member of the late pool gives it as his opinion that cheap goods would be run upon for a season and would be sold at cost of manufacture, or very little more, but goods of better quality would not be any cheaper. All manufacturers would deal direct with the retailer and many of the jobbers would cease carrying stocks. Whether the pool would ever be reestablished would depend upon the developments of the ensuing year.

The increased speed of freight transportation on the Northern lakes is as remarkable as the great enlargement of carrying capacity.

The number of hogs packed in Chicago during the first half of the present season is 1,016,000, which is a decrease of 272,838 compared with the same time last year. Twelve regular houses were engaged in the business, or one-third less than a year ago.

A convention of all persons interested in the waterways is called by the chairman, B. D. Woods, to meet at Memphis, October 20, for the purpose of urging upon Congress the necessity of making still greater provision for the improvement of the Western waterways. This will in all probability be the largest convention that has ever met in the West or South for this purpose.

The new assessment rolls for New York City show the assessed valuation of real and personal estate for the present year to be \$1,507,640,663, which is an increase of \$86,672,377 over the assessment for 1886. The totals are, for 1887, \$1,507,640,663, and for 1886, \$1,420,968,286. The valuations of real estate are increased in every ward. The highest in the Twelfth ward is \$24,000,000; in the Twenty-second, \$9,856,000; in the Nineteenth, \$6,717,000.

A toothpick manufacturing association in the Eastern States, who have their center in Maine, have contracts for the coming year sufficient to load a train of 50 cars with nothing but toothpicks, and meanwhile will take out of the State of Maine five thousand millions of these little implements. One mill is at Belmont, N. Y., and others are in Michigan and Wisconsin.

Within a few weeks work will be begun on the new dry dock which is to be built at the Navy Yard at a cost of \$550,000. The caisson will be a double-ended hull, with straight stems and a deep keel. It will have two decks and a rail, the top of the latter being 3 feet 6 inches above the center line of the main deck. The entire structure will be water-tight. Following are the general dimensions:

	Feet.	Inches.
Length over all.....	80	3
Length of keel.....	51	6
Breadth of beam amidships—inside.....	18	0
Depth of hull amidships—inside.....	21	5
Depth of keel from latter point.....	12	7
Total depth.....	34	0

The pumps for the docks will have a discharge capacity equal to 40,000 gallons per minute. Thomas O'Connell is the contractor who will construct the caisson. He built the Simpson dock, at Erie Basin, 22 years ago.

Christian E. Detmold, civil engineer, who built the famous Crystal Palace in this city in 1853, and in his earlier years built the Charleston and Hamburg Railroad, in South Carolina, one of the first railroads in the country, died at his home in this city on July 2. He was a native of Hanover and was born in 1809.

The work of building an electric railway on Fulton street, this city, to connect the ferries at the foot of Cortlandt and Fulton streets, on opposite sides of the city, was commenced on Saturday last, and a considerable section of track laid within a few hours. The whole road, it is expected, will be in operation within 60 days. The company have made arrangements by which they will have the use of the Belt Line tracks in West street from Fulton street to Cortlandt street on the one hand, and to Chambers street on the other. It will use the Ninth Avenue Railroad Company's tracks from Broadway to Greenwich street, and the Bleeker Street Company's single track from Fulton Ferry to William street. The rails to be used by this company are the same as those now in use on the Chambers street road and required by law to be used by all new companies. They are side gearing rails weighing 45 pounds to the yard. The cross ties are laid first, and the stringers laid upon them so that the upper surface is slightly below the level of the street. By this arrangement the top of the rails is made level with the surface of the cobble stones. The cars will be run by electricity on the traction principle according to what is known as the Bently Knight system. The road will be the first practical one of the kind ever tried. The cars will be of what is known as the 16-foot standard—that is, about the size of the cars now used on Broadway, and capable of seating nine persons on each side. It will take two men to run each car. Only the tracks of the road are being laid at present. The conduits will be laid later.

By insisting upon the payment of a tax by commercial travelers the courts of several States have already placed themselves in a position of antagonism to the recent de-

cision of the Supreme Court of the United States. The latest instance is in the Court of Appeals of Texas, upon a writ of *habeas corpus*, brought to effect the release of W. G. Asher, a citizen of Louisiana, who had refused to pay the tax required under the State law, and was arrested and fined. The judgment was that "the relator be remanded to the custody of the sheriff of Harris County, to be by him kept until payment of the fine and costs adjudged against him, together with the costs of the *habeas corpus* proceeding."

Thos. S. Baldwin, of Quincy, Ill., on the 4th inst., jumped from a balloon 1 mile above the earth and descended in safety in 3 minutes and 20 seconds by means of a parachute, made of silk and resembling an umbrella, 18 feet in diameter.

The Chinese census of 1875 gave the population of the empire at 435,000,000. Since that time Tonquin has been lost, with several million people, and Kasgharia has been reconquered. Among no people with any degree of civilization is the birth rate so high as in China, and although the death rate in the densely crowded districts is very great, there is every reason to presume there are now 450,000,000 people in China. These figures represent more than one third of the population of the globe. It is a greater population than that of all Europe, and three times the number of people on the Western continent. Even at these enormous figures the average number of people to the square mile for the whole empire—85—is not so high as in some parts of the United States.

It is reported, on apparently good authority, that a close alliance has been formed between the Jersey Central, in which Mr. Corbin is actively interested, and the Lehigh Valley. By this alliance the Lehigh Valley is to send all its freight to Jersey City over the Jersey Central, and the latter is to have access to the magnificent terminus of the Lehigh Valley in Buffalo. The latter is also to unite with the Jersey Central in making improvements upon a large scale to the terminals of Jersey Central at Communipaw.

Many inventions are made by workmen in the course of their daily duties, using the time and material of their employers in the usual course of experiments necessary to the application of a new idea. When afterward the invention turns out to be a thing of value, or a dispute arises between the inventor and his employer, the patent frequently becomes the subject of litigation which is very difficult to determine with anything approaching exact justice. The Supreme Court of Wisconsin having a case of this kind before it decided in favor of the workman. It held as a guiding principle that it is the conception in the perfected machine, not the materials, workmanship or skill employed in working it out that constitutes the invention, and hence that the workman who suggested the idea is the lawful owner of the invention.

The way Englishmen are crowding themselves into various lines of enterprise in Mexico prompts a correspondent at the Mexican capital to say: "The English are capturing the banking business, or such part of it as the national bank leaves open to them, and the result will be that the English will gain a grip on this country that the United States cannot easily shake off. Had our Congress put through the reciprocity treaty two or three years ago American banks would have come in to aid the development of American trade, but no American here has any belief that our Congress will see the worth of this Mexican business till every other nation has seized on all that can be obtained. Fortunately we have the two great railways, the Central and the National, but so sound a journal as the *London Economist*, just at hand, says that these corporations are rapidly becoming more English than American. It seems odd that a country like the United States, which used to be a pushing, aggressive, commercial nation, is so easily beaten nowadays in foreign trade extension."

The coopers of New York City have decided to submit to their employers a new scale of wages, to commence September 15, 1887. Working hours are to be ten per day and nine on Saturday; no non-union men to be employed; no man to be discharged except for negligence or drunkenness; reasons for discharge to be stated; wages, \$3 per day; infirm men's wages to be decided by the union; pay day to be Saturdays; all piece work to be abolished; only one apprentice to be allowed to every 10 coopers; apprentices to be not less than 10 nor more than 18 years of age to serve for three years at wages, \$6, \$9 and \$12 weekly. These terms are to be accepted by August 15.

The anniversary of the Confederation of the British Provinces in Canada was made the occasion last week of an address by Mr. Wiman, of New York, before an assemblage at Dufferin Lake, wherein he depicted in glowing terms the advantages possible to be realized through free commercial intercourse between the Dominion and the United States, and this without disturbing the form of government in the Dominion, or lessening the fealty of British subjects to the Crown. The native deposits of copper in Canada, he claimed, were superior to any other in the world. In Newfoundland there are 5000 square miles of copper-bearing territory, and in no small portion of it nickel exists in large quantities. The natural market of Canada, the speaker claimed, is the United States.

Trade Report.

NEW YORK.

The week has been so much shortened by the holidays that very few transactions have taken place, and prices, with few exceptions, have remained stationary.

American Pig.—There is practically nothing to report, the features which have characterized the market for so long a time still controlling it. Standard brands remain \$21 @ \$21.50 for No. 1 Foundry, \$19.50 @ \$20.50 for No. 2 Foundry, and \$17.50 @ \$18.25 for Gray Forge, with outside brands available at 50¢ @ \$1 less.

Scotch Pig.—The market is quiet, but is fairly firm, chiefly on account of higher freights. We quote: Coltness, \$22 @ \$22.50; Glengarnock, \$20.50 @ \$20.75; Shotts, \$21.50 @ \$21.75; Gartsherrie, \$21 @ \$21.25; Carnbroe, \$20.75 @ \$21; Summerlee, \$21.50 @ \$21.75; Dalmellington, \$20.25 @ \$20.75; and Eglinton, \$19.75 @ \$20.

Spiegel Eisen.—Nothing has been done, and values remain at \$27 @ \$27.50 for 20%.

Bessemer Pig.—We do not hear of any business either in Domestic or in Foreign.

Bar Iron.—The market has been quiet. We quote Common, 1.8¢ @ 1.9¢; Medium, 1.9¢ @ 1.95¢, and Refined, 1.05¢ @ 2.25¢, on dock.

Structural Iron.—We quote for large quantities: Angles, 2.25¢ @ 2.40¢; Tees, 2.70¢ @ 2.75¢, and Channels and Beams, 3.30¢, base on dock.

Plates.—We quote for round lots of Common or Tank, 2.25¢ @ 2.50¢; Refined, 2.50¢ @ 2.60¢; Shell, 2.6¢ @ 2.8¢; and Flange, 3.5¢ @ 3.8¢; Extra Flange, 4.25¢ @ 4.50¢. For Steel Plates quotations are as follows: Tank, 2.6¢ @ 3¢; Ship, 2.9¢ @ 3¢; Shell, 2.9¢ @ 3.15¢; Flange, 3.15¢ @ 3.50¢, and Fire-Box, 3.75¢ @ 4.50¢, on dock.

Steel Rails.—The only transactions reported is the sale of 8000 tons by an Eastern mill. We continue to quote \$38 @ \$39.50 at Eastern mill, according to time of delivery, locality, &c.

Blooms and Billets.—There has been some inquiry both from the West and from Eastern Pennsylvania. The foreign Steel works appear to be so busy with orders that they show little disposition to quote low prices, and importers now ask \$30.50 @ \$31 for Billets.

Wire Rods.—While the discussion on the duty on Wire Rods is going on, little or no business is being transacted. We quote nominally \$38.25 @ \$38.75.

Old Rails.—The market is irregular, and is difficult to review, opinions varying widely. There are a number of orders in the market from Western consumers, who are now sure of running along without labor complications. As yet none of these orders have been placed, the only transaction during the past five days being the purchase on speculation of a 500-ton lot of Doubles, afloat to this port. Sellers ask \$23 @ \$23.50 for Tees, and \$24 @ \$25 for Double Heads, prices which buyers are apparently not yet ready to pay. The local supply in store is held by a comparatively small number of dealers, and sellers abroad, for shipment, are asking higher prices. Consumption is not likely to be very heavy during the current month, when many of the mills close down for weeks for repairs, and some of the largest purchasers have stock for months to come. On the other hand, the quantity available from American roads has been unexpectedly small thus far, judging from the sales in the open market East and West. It must be taken into account, however, that a good deal of the domestic material, notably in the West, is taken over in part payment for new Steel Rails.

Railroad Fastenings.—Spikes are quoted 2.40¢ @ 2.50¢ net; Angle Fish Bars, 2.1¢ @ 2.25¢; Steel Angle Bars, \$2.20 @ \$2.30; Bolts and Nuts 3¢ @ 3.20¢, and Bolts and Hexagon Nuts 3¢ @ 3.30¢.

Metal Market.

Copper.—The Copper market in this city has shown extreme strength during the past week, buyers having come forward with liberal bids, but were not able to find holders disposed to part with their holdings, even at the enhanced prices. From 100,000 to 200,000 lb Lake were picked up for July delivery at from 10.10¢ to 10.12½¢, but since then to 15¢ has been freely bid and refused for spot and July deliveries; 10.20¢ is bid for August, 10.30¢ for September, 10.35¢ for October and 10.40¢ for November and December. As buyers raise their bids sellers retire, and it looks as if spot Copper would soon reach 10½¢, when, as usual, the crowd will rush in and bring it back to its legitimate value. Casting Copper is also firmer, and the various brands are held firmly at 9½¢ @ 9¼¢. Best Selected is cabled £45. 5/ from London, while Chili Bars stood £40 July 1, £39. 5/ July 5 and this morning £39. 12. 6. Export of Pyrites from Spain during the first four months, 266,679 tons, against 223,555 in 1886 and 278,152 in 1885; of Precipitate, 9823, against 8125 and 9402. As much as 10½¢ has been paid for Lake Copper on the spot in this market yesterday, we are assured.

Tin.—There has been very little doing in this market, owing to the holidays. Spot Tin remains scarce, and is not obtainable below 23¼¢, even higher prices than that having been paid on the quiet, thus clearing late arrivals. For future delivery our market seems to be guided by London, where prices have been improving steadily from £102. 5/ to £102. 17. 6. We quote: July delivery, 22.80¢ @ 22.85¢; August, 22.75¢ @ 22.80¢, and September and October, 22.60¢ @ 22.65¢. Shipments from London are offered in moderate quantities at 22.80¢, without for the moment attracting buyers. **Tin Plates.**—No new features have arisen; the trade has been the reverse of active, but prices remain as firm as heretofore at following quotations per box, large lines: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5; ditto Coke Finish, \$4.65 @ \$4.70; Charcoal Ternes, \$4.30 @ \$4.50, and Coke Tin, \$4.37½ @ \$4.50. Liverpool cables Coke 13/6.

Lead.—Sales for the week have not exceeded 300 tons at 4.50¢ down to 4.45¢ Common Domestic; but not over 4.40¢ could probably be got at the close, the market winding up listless at 4.40¢ @ 4.45¢, nominally, and Refined, 4.55¢ @ 4.60¢, also nominally. Chicago and St. Louis are 4.35¢, with Common. Export of Pig Lead from Spain during the first four months, 42,972 tons, against 38,187 in 1886, and 42,138 in 1885. There has been a break in Soft Spanish Lead in the London market to £11. 17. 6, while English Pig is cabled £12. 2/6 this morning.

Spelter and Zinc.—Nothing of special interest has transpired in Common Domestic Spelter since our last report. A moderate demand continues to exist, and is currently filled at 4.52¢ ½ @ 4.55¢ as to brand, while Silesian may be quoted 4.80¢, remaining £14. 12. 6 in London. Export of Calamine from Spain during the first four months, 8287 tons, against 10,002 in 1886, and 15,833 in 1885.

Antimony.—Without any change in London, which continues at £34 with Hallett, we have remained moderately active here at 8¼¢ @ 8½¢ the latter, and 9¼¢ @ 9½¢ Cookson.

New York Metal Exchange.

The following sales are reported:
THURSDAY, June 30.
30 tons Tin, July, 27.80¢
10 tons Tin, spot, 28.15¢
10 tons Tin, July, 28.75¢
25 tons Tin, prompt shipment, 28.67½¢
30 tons Tin, October, 28.50¢
10 tons Tin, spot, 28.15¢
25,000 lb Copper, spot, 10.05¢
25,000 lb Copper, July, 10.10¢
FRIDAY, July 1.
10 tons Tin, August, 28.70¢
50,000 lb Lake Copper, 10.10¢

Philadelphia.

Office of The Iron Age, 230 South Fourth St., PHILADELPHIA, July 5, 1887.

One half the year has passed without bringing with it the improvement in business that was very generally expected. But it is by no means certain that these hopes will not be realized before the next six months have passed away. The conditions are favorable, but recent events are admonitory not to be too sanguine in making predictions. Indications, however, as we have said, are of a most encouraging character. Large consumers of Iron are almost all busy, and those that are not in that condition are likely to fill up at any moment. Railway interests are the largest consumers, embracing, as they do, Rail manufacturers, Locomotive and Car builders, Machine Tools, Bridge building, &c. These, almost without exception, are crowded with orders, and aggregate a larger amount of work under contract than was ever known before. Ship-building is moderately active, but promises to be much more so a few weeks later on. Government contracts alone will make a great deal of work, but in addition to that there is every prospect of a great deal of work from other sources. Pipe manufacturers were among the largest consumers of Iron during the past 12 months, and are likely to be so for a long time to come. They have bought very little, however, during the past 10 or 12 weeks, and the loss of that demand has materially affected some of the mills. But there is every reason to believe that there will be a renewal of the demand soon. Pipe makers bought too heavily in the spring, and they are now working up their stocks. The price of Pipe, they say, does not warrant the price paid for Skelp, so that they have not been in the market recently. The demand for Pipe keeps up all the same, however, so that makers cannot remain out of the market much longer. The fact of the Reading Iron Works closing their large establishment indicates that that management fail to see any prospect for a reasonable margin of profit, although they inform us that they could fill up for months, providing they would accept prices now generally current. Still, if there is a genuine demand for Pipe, it is hard to believe that it will be supplied at a loss. The fair inference would be that a renewed demand for Skelp will advance prices of that article, and, to the same or a greater extent, advance Pipe also. Prices are undoubtedly low; the enormous increase in productive capacity has, in fact, made everything low, but admitting that, it is not likely that business will continue to be done at a loss. On the whole, therefore, the outlook for the balance of the year may

be taken to indicate a gradual increase in the volume of business, and, in all probability, a corresponding hardening in prices.

Pig Iron.—There has not been any great fluctuation in the price of Pig Iron, \$1 @ \$1.50 per ton being the extreme range. The change of sentiment, however, would represent much higher figures. When Iron was advancing some people predicted a \$5 or \$10 rise, and when the reaction came a serious decline was looked for with almost equal confidence. But, as a matter of fact, prices refused to go down almost as stubbornly as they refused to go up, and the second half of the year finds quotations of Foundry Iron at precisely the same figures as they were six months ago. Mill Irons are a trifle lower, say 50¢ per ton, but as regards large consumers they are probably just the same; in fact, contracts for the last half of the year are being renewed on the same basis as made for the first half. The advances, therefore, were simply on small lots, the highest figures having been made in February. The output of Pig Iron (until the Coke strike) was the largest in the history of the country, and to this must doubtless be attributed the entire absence of "a boom." Stocks are probably not much, if any, greater than they were in January, so that the position may be considered a very healthy one. As to the outlook, it is not easy to make predictions, although the general sentiment, and for that matter, all the conditions appear to favor somewhat better prices. The demand, as we have tried to show, is likely to be very large, which is one reason for firm prices. Another reason is, that cost of production is much higher than it was, so that only a few can make Iron at present prices, consequently any increase in demand can only be met by paying higher figures. There may of course be some accumulation during the next three or four weeks, and some of the weaker companies may try to realize at best prices obtainable, but the chances are that to-day's quotations will be lower than the average of the next six months. The following are the extreme quotations during each month to date:

January.		
No. 1 Foundry, at tide.	21.00	@ 22.00
No. 2 Foundry, at tide.	19.50	@ 20.00
Gray Forge, at tide.	18.00	@ 19.00
February.		
No. 1 Foundry, at tide.	21.00	@ 22.00
No. 2 Foundry, at tide.	19.50	@ 20.00
Gray Forge, at tide.	18.50	@ 19.50
March.		
No. 1 Foundry, at tide.	21.50	@ 22.50
No. 2 Foundry, at tide.	20.00	@ 20.50
Gray Forge, at tide.	19.00	@ 19.50
April.		
No. 1 Foundry, at tide.	20.50	@ 21.50
No. 2 Foundry, at tide.	19.00	@ 19.50
Gray Forge, at tide.	18.00	@ 18.50
May.		
No. 1 Foundry, at tide.	20.50	@ 22.00
No. 2 Foundry, at tide.	19.00	@ 19.50
Gray Forge, at tide.	18.00	@ 18.50
June.		
No. 1 Foundry, at tide.	20.50	@ 22.00
No. 2 Foundry, at tide.	19.00	@ 20.00
Gray Forge, at tide.	17.00	@ 17.50

It should be said that a very large number of furnaces are running at Bessemer, which is taken on contracts soon as it is ready for delivery. In noting the unusually large production of Pig Iron, therefore this fact should not be overlooked. The chances are, indeed, that of Foundry and Mill Irons the output is not much beyond what it was a year ago.

Manufactured Iron.—The first half of the year has not been a satisfactory one to manufacturers, although the outlook has improved somewhat during the past week or two. Prices opened pretty well toward the top, and after the first of March weakness began to develop, and continued almost without intermission until toward the middle of June. The mills commenced the year full of orders at about 1.9¢ for Bars, 2.1¢ for Skelp and 2.25¢ for Plate Iron. Prices advanced probably 5¢ per ton, but no great amount of business was done at much over 2.1¢ for Bars, 2.2¢ for Skelp and 2.4¢ for Plates. Labor was advanced to a 2.2¢ base, and so continues to this date, although the selling price has not averaged within 5¢ per ton of that price. Consequently manufacturers were badly disappointed, but, in the hope of better times, they continued taking business on the best terms they could make, which were for awhile as low as 1.9¢ @ 1.95¢ for Bars, 2.15¢ @ 2.2¢ for Plates and 2¢ for Skelp. During June there were renewed indications of a demand, and, in fact, a good deal of business was taken for July delivery, at prices somewhat better than the lowest, and a slight additional advance asked for later deliveries. There is an impression that a great deal of business that was postponed on account of the Interstate Commerce bill will be placed during the fall months, so that, on the whole, manufacturers quote somewhat cautiously, until it is seen what the outcome of the next month or six weeks is going to be. A good deal depends on the West. Locally there is no doubt that business will be very active, and, apart from Western competition, prices ought to improve, but in the meantime both buyers and sellers are inclined to be very conservative. The highest and lowest prices during the six months were as follows: Best Refined Bars, January 1, opening at 2¢; January 20 to March 1, highest, 2.2¢ @ 2.25¢; March 15 to June 1, lowest, 2.1¢ @ 1.95¢; July 5, quoted firm, 2¢ @ 2.1¢. Skelp Iron (Grooved).—January 1 to March, 2.2¢ @ 2.25¢; March 31 to June 1, 2.15¢ @ 2¢; July 5, offered at 2¢. Plate Iron.—January 1 to March 1, highest, 2.4¢ @ 2.5¢; March 7 to June 15, the lowest, 2.3¢ @ 2.15¢; July 5, quoted firm at 2.2¢ @ 2.25¢. Angles

—Have remained firm at 2.3¢ during the entire six months, with some little rebates on certain sizes, but ordinarily 2.3¢ has been and still is a firm quotation.

Steel Rails.—There is only one story to tell—viz., uniform activity and firmness. Prices opened in January at \$37.50 @ \$38 at mill, and have steadily appreciated to about \$39 or \$39.50 at mill. The entire capacity of all the mills in the country is supposed to be inside of 2,000,000 tons, and as about nine-tenths of that amount are already under contract, there is not much danger of work being scarce. Imports will reach pretty nearly 60,000 tons during the half year, deliverable chiefly at Pacific or Gulf ports, latest quotation being \$40.50 @ \$41, New Orleans or Galveston.

Old Rails.—Speculation has been very active in Old Rails, but to this date does not appear to have been very remunerative to holders. The year opened with prices not far from top, \$25 being quoted for T's, and two weeks later \$25.50 @ \$26. Toward the close of January the demand fell off, but prices were fairly maintained until about the middle of March, when certain parties began to realize, and from \$24 to \$21.50 was a steady decline, covering the period of time from March 1 to May 15. From the latter date to about June 15 most of the arrivals were taken at from \$21.50 to \$21.75, but as these began to drop off holders recovered their courage, and gradually advanced their figures to \$22, \$22.50 and \$23, and even then the offerings were not large. At this date there are comparatively few Rails afloat for this port, so that holders of lots in store talk \$24 @ \$25, and, in fact, are not anxious to sell Rails until they can see a little further ahead. Lots ex-ship, if any come to hand, might be sold at \$23, but prices are more or less nominal, and it is hard to say what price the next sale will be at. Imports of old material for six months about 120,000 tons.

Chicago.

Office of The Iron Age, 95 and 97 Washington St., CHICAGO, July 4, 1887.

Pig Iron.—The situation is daily growing more interesting to buyers of Pig Iron. The supply is undoubtedly short in every grade of Iron, except some kinds of Southern Iron. Consumers of Lake Superior Charcoal Iron are showing their anxiety by anticipating their annual purchases, and endeavoring to make arrangements to secure at least a part of what they will need. The supply of Coke Iron is now so restricted that some houses are unable to furnish any Coke Iron whatever, and great pressure has thus been thrown upon their more fortunate competitors. The transactions of the past week have been considerably greater than those of any week for some time, and the prospects are very favorable for a heavy demand during the next two or three weeks. Negotiations are now pending of such a character that they will undoubtedly be closed within that time. It is difficult to see how an upward movement in prices can be arrested under the circumstances. If the Coke strike should suddenly cease, and the Coke furnaces now idle should all start up, it will take from 30 to 60 days to fill the contracts which were on the books of the companies when the Coke strike began. In the meantime a large number of buyers will be in the market pressing for early deliveries, and such competition for the available supply must have a hardening effect upon prices. Those who are earliest in the field are able to secure Iron at the low prices now current, but it will take a very slight increase in the present volume of trade to start prices upward. Southern Iron is still playing an important part in this market, but its influence is not now felt so much as some time ago. Prices are held more firmly, and less effort is being made to push sales. Quotations are as follows for cash, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$23; Southern Cold Blast Charcoal, \$27; Blackband Coke Softeners, \$22 @ \$23; Hanging Rock and Jackson County Softeners, \$21; Straight Coke Foundry, No. 1, \$22 @ \$23; No. 2, \$21.50; No. 3, \$19.50; Coke Bessemer, run of furnace, \$22; Southern Coke, No. 2, \$21.25 @ \$22; No. 2½, \$20.75 @ \$21; No. 3, \$19.75 @ \$20.

Bar Iron.—A fair demand for Bar Iron is reported for the past week, with some inquiries in the market for good sized lots. The signing of the Wages Scale by the Western Iron Association has slightly complicated the situation, as the representatives of the mills directly effected are unable to settle upon the price which they will now ask. Other mills, however, are ready to take advantage of the situation, and prices have slightly fallen, so that they are now back to the old point of \$1.85 for Common Bars in carload lots, f.o.b. Chicago. Iron made from All Muck Bar can be had at 2.1¢ @ 2.15¢ in carload lots from mill, f.o.b. Chicago. Store prices remain as they were, at 2.15¢ @ 2.2¢ for Common and 2.2¢ @ 2.3¢ for All-Muck Bar.

Structural Iron.—The demand for Iron for bridgework continues very active. Manufacturers' agents say that this year's trade is the most active ever experienced in this line. New bridgework is constantly coming up and more orders are in sight. The demand for building material has been less active during the week. Prices are practically unchanged.

Plates.—Mill orders have been few during the past week, but store trade has been un-

usually active in view of a possible advance in prices, which is now regarded as almost certain.

Sheet Iron.—Manufacturers are holding their prices firmly, and an advance of \$1 or more per ton is regarded as inevitable in consequence of the higher scale of wages adopted for the coming year. Jobbers are still selling on the basis of 3.4¢ for No. 27, but are talking of advancing their rates at an early day to cover increased cost. They report a great deal of inquiry for fall delivery, besides a considerable demand for immediate use.

Galvanized Iron.—The demand is still reported as excellent by manufacturers' agents and jobbers, but prices have not responded to the better movement of goods. Jobbers sell at 60¢ discount for Juniata and 62½¢ for Charcoal.

Merchant Steel.—The manufacturers of agricultural implements are talking of increased business, and the demand from them for Steel is expected to be greater than ever. Thus far they have not begun to place their contracts for the season. A fair trade is in progress from store at former prices.

Steel Rails.—The outlook is improving and large orders are in sight for fall delivery. Prices are firm at \$42 for deliveries to suit manufacturers.

Scrap.—The demand for Wrought is quiet, owing to the stoppage for repairs of many Western mills. Cast is moving in small quantities. Prices show no material change. Quotations for carefully selected Scrap are as follows, per ton of 2000 lb: Railroad Shop or No. 1 Forge, \$19 @ \$20; Railroad Track, \$17 @ \$18; Mill or No. 1 Wrought, \$15.50; Light or No. 2 Wrought, \$9.50; Boiler Plates, \$14.50; Pipes and Flues, \$13; Stove Plate, \$10.50; Machinery Cast, \$15; Cast Borings, \$9; Machine Turnings, \$12; Axle Turnings, \$13.50; Coil Steel, \$15; Leaf Steel, \$16.50; Locomotive Tires, \$19; Horseshoes, \$20; Axles, \$24.50; Mixed Country Wrought, \$13 @ \$14.

Old Rails and Wheels.—No transactions are reported in this market. Rails are quoted at \$22.50 @ \$23, and Wheels at \$19.50 @ \$20.50. Holders of Wheels are not inclined to part with them at present figures, believing that prices will be higher in sympathy with Charcoal Pig Iron.

Wrought-Iron Pipe.—Prices have been somewhat demoralized for the past month, and the regular discounts have been wholly ignored. The demand has been excellent, however, and the outlook for the fall trade is so bright that manufacturers are confident of a restoration of the old prices within the next fortnight.

Nails.—With the gradual withdrawal from the market of the manufacturers who were selling at very low prices, jobbers' views have stiffened, and their prices are advancing. Carload lots of Steel Nails are now firmly held at \$2.20, with \$2.25 asked in many cases. Iron Nails are, as usual, 10¢ cheaper. Jobbers report a very large demand from the retailers, whose stocks are now quite light. For Wire Nails there is an increasing demand, trade growing steadily. Jobbers ask \$3.20 @ \$3.25 base for Wire Nails, while manufacturers are reported to be endeavoring to push their prices up a trifle, in which they are assisted by the improved condition of the Cut Nail trade.

Barb Wire.—The demand has fallen off very much, as usual at this time of the year, but prices are steadily held by jobbers at 3.50¢ for Painted and 4.25¢ for Galvanized, in small lots.

General Hardware.—Jobbers report a continuance of the excellent trade with which they have been favored for so long a time. The demand is exceedingly good for all kinds of wares. Roofing Tin is still very scarce. Large Worcester is now held at \$11 per box, and larger S.T.P. and equal at \$10.25. A new Screw list has been issued, making a lower rate for small sizes and an advance for larger ones, so that the average price is about the same as before. No other changes in price have transpired.

Messrs. Block, Pollak & Co., of Chicago, dealers in Old Rails, Scrap Iron, &c., have been compelled by the necessities of their growing business to seek a better location than their old quarters at Sixteenth street and Wentworth avenue. They have therefore purchased five acres of land on the Chicago and Western Indiana Railroad, bounded by Fifty-second, Fifty-third, Wallace and Desplaines streets, on which they are erecting a large warehouse. Side tracks will be run into their yard, and their facilities for transacting business will be of the best character. Their offices have been removed to rooms 70 and 71 in the Commerce Building, 14 and 16 Pacific avenue, near Jackson street, so as to be conveniently located for city business.

Messrs. Katlinsky, Farber & Levine, who formerly conducted their business in scrap iron, steel and metals under the name of the Chicago Iron and Metal Company, have secured a certificate of incorporation as the Northwestern Iron and Metal Company, and will continue to transact business under that name at Nos. 272 to 278 South Clinton street, Chicago. They state that the new name has been adopted because their old name has been appropriated by other parties, and this action is deemed necessary to avoid mistakes.

Trade Report.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue,
Pittsburgh, Pa., July 5, 1887.

The most important item we have to note is the settlement of the wage scale for the year beginning July 1. Concessions were made on both sides; the advance of 10 per cent demanded by the Amalgamated Association was granted, but a number of extras also asked for were not allowed. However, it does not follow because the scale has been adjusted that all the mills will continue to run. Some mill-owners contend that the present condition of the market for Finished Iron does not warrant the enhanced cost of labor. It is well known that some firms are pretty well supplied with orders for specialties, and that it was their intention to sign the scale. This was evident from their non-attendance at the meeting of the manufacturers in regard thereto, and no doubt brought the matter to a close sooner than it would otherwise have been. As it now stands those mills having business will continue in operation, while others not so situated will remain idle for a time at least. The Coke strike still continues. The Pig Iron furnacemen are still clamoring for cheaper Coke, but Coke operators say they cannot reduce the price of Coke and pay an advance for labor. The fact that the ovens owned and controlled by Carnegie, Phipps Co. are paying the advance makes the strikers all the more determined. The Coke strike, therefore, has an important bearing upon the Iron trade.

Pig Iron.—Though the wage scale is settled, many mills will remain idle for a time, which will decrease consumption. In regard to prices there has been no quotable change since our last report. Consumers are bearish, alleging that Pig Iron is higher relatively than the products, while producers point to the tight supply and idle furnaces as indicating that there is more likely to be an advance than decline. The furnaces here and in the valleys, with few exceptions, are either out of blast or banked up, and the few in operation have no iron to sell, having contracts to absorb their entire production. Thus, while the market is strong in one respect it is weak in another. If the situation should continue for a few weeks more a stronger market may be looked for, as the supply, especially of desirable qualities, is steadily being reduced, but in the event of the Coke strike being brought to a close and the price of Coke reduced, a number of furnaces would at once be started up and the result would be entirely different. As will be seen, therefore, the near future of the market hinges upon a number of contingencies, all of which have an important bearing, and there is a good deal of uncertainty connected therewith. Quotations may be fairly given as follows:

No. 1 Neutral Gray Forge	\$18.75 @ \$19.00, 4 mos.
No. 2 Neutral Gray Forge	18.00 @ 18.25, 4 "
All Ore, Mill	20.00 @ 20.50, 4 "
No. 1 Foundry	21.50 @ 22.00, 4 "
No. 2 Foundry	20.00 @ 20.50, 4 "
No. 3 Foundry	19.00 @ 19.50, 4 "
No. 1 Charcoal Foundry	23.00 @ 23.50, 4 "
Cold Blast Charcoal	27.00 @ 30.00, 4 "
Bessemer Iron	21.50 @ 22.00, 4 "

Muck Bar.—There is not much improvement in demand, but in view of the enhanced cost of puddling, which went into effect on the 1st inst., we quote an advance of 50¢ @ \$1 per ton, \$30.50 @ \$31.50, cash, as to quality. There is a difference of \$1 per ton between good, strong Neutral and that of a cold, short tendency, and a good many buyers prefer to pay the difference for the former, especially those bearing a regard for the reputation of their product.

Manufactured Iron.—The signing of the wage scale by the manufacturers will no doubt cause buyers to breathe easier, as in the event of a shut down, higher prices would probably have been obtained. However, as already intimated, some of the mills now stopped for stock-taking and repairs will not be started up until the situation improves. It is contended by mill-owners that the present cost of the raw material is higher relatively than the products, and therefore that there is little or no margin for profit in present prices. The general Merchant Iron trade is light, but the indications are that it will improve before the close of the month. The Skelp Iron trade is also disappointing, but it, too, will probably improve before long, although it is not likely that the expectations entertained by the more sanguine are likely to be realized. There is a continued good degree of activity as regards Structural and Bridge Iron; those mills making a specialty of these have about all they can do.

Nails.—The market is firmer, and so far as we can learn there are now but few, if any, manufacturers here or west of here willing to sell below \$2, 60 days, 2¢ off for cash. Private advices report that some of the Wheeling manufacturers who were down to \$1.90, and even \$1.85, are now demanding \$2 and refusing to sell for less. The Pittsburgh nailers have agreed to accept the same price for cutting paid for same kind of work at Wheeling. As jobbers have been buying very sparingly for some time past, it is evident that they are low in stock, and will soon have to replenish, and an improved trade is looked for before long. While the demand for Wire Nails is improving, they are not supplanting the Cut Nails as rapidly

as a good many people imagine. The next monthly meeting of the Western Nail Association takes place to-morrow week.

Wrought-Iron Pipe.—There has been no important change in the situation during the past week; the market continues in an unsettled and unsatisfactory condition. There is a fair degree of activity, but prices continue unsettled and irregular. As has been the case for some time past, each firm is making its own price, hence there is no uniformity, and herein is one of the most discouraging features of the business at the present time, and it is impossible to quote prices with any degree of accuracy in consequence. While the last regular meeting adjourned over until September, a special meeting can be called at any time.

Old Rails.—The market is much firmer, and prices have further advanced. We now quote foreign Tees at \$25.75 @ \$26, and Double Heads at \$26.75 @ \$27. Sale of 1500 tons for July and August delivery reported at \$26.85.

Steel Rails.—Heavy sections are still quoted at \$39 @ \$40, cash, free on cars at Pittsburgh. Mills here, as elsewhere, are pretty well sold ahead, and it is difficult to place an order for near-by delivery.

Billets, &c.—We are advised of a sale of 1000 tons Bessemer Billets, at \$31, 60 days, but it is doubtful whether an order for another could be placed at that figure, as the market is much firmer. Foreign Billets cannot be laid down in Pittsburgh much, if any, under \$32 @ \$32.50, cash. No sales of Nail Slabs reported and there does not appear to be much inquiry, but they, too, are firmer. Last sales of Rail Ends reported were at \$22 @ \$22.50, for American; Bloom Ends quoted, in absence of sales, \$21 @ \$21.50.

Railway Track Supplies.—Spikes have been reduced from 2.75¢ to 2.60¢, 30 days, delivered. Splice Bars remain unchanged at 2.10¢ @ 2.20¢, and Track Bolts, 3.30¢ with Square, and 3.40¢ with Hexagon Nuts. The indications are favorable for a good trade the last half of the year, and the fact that Old Rails have stiffened will steady up the market for Spikes.

Old Material.—There is no improvement in demand, but it is likely that there will be before the close of the present month. Prices remain unchanged. No. 1 Wrought Scrap, \$20.50 @ \$21, net ton; Wrought Turnings, \$15.50 @ \$16; Car Axles, \$20; Cast Borings, \$13, gross; Old Car-Wheels, nominal at \$20 @ \$20.50, gross.

Mr. John Q. Everson having sold to Robert R. Hammond all his interest in, and withdrawn from, the firm of Everson, Hammond & Co., Limited, the present style of the firm is W. J. Hammond & Sons, Limited. The new firm will continue to operate the Pennsylvania Iron and Steel Works in all its departments, making a specialty of the lighter gauges of Sheet Iron and Sheet Steel.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts.,
CHATTANOOGA, TENN., July 4, 1887.

Extensive and steady rains at intervals throughout the entire South have advanced the crop prospects to an unusual degree, and farmers and planters are in good spirits. The results are of course beneficial to all lines of trade, and merchants are beginning to feel the effects. Other than this there is nothing new. The location of new manufactory enterprises continues. Of late in our immediate vicinity a new Tool factory, also a large concern for the manufacture of Coffins and Caskets, have been located, and the buildings are well under way. These will employ about 150 men each. There is no lack of orders, and business could not be better.

Pig Iron.—The last three or four days have developed several inquiries for round lots of Pig Iron; a number of sales have been made at a firm advance of 50 to 75 cents per ton, and many more could be made if the iron was in the market and producers were inclined to sell. The fact is that for the last week or two the discovery has been made that good Foundry Irons have been scarce and hard to get in the South, and, strange as it may appear, the Southern foundries have had some difficulty in getting their orders filled, and now, within the last three or four days, come some urgent inquiries from the East, with some sales. Three round lots of a standard brand of No. 2 have been sold to go to Boston at \$17 net cash, at the furnace, and two lots to New York of No. 2 that netted the Furnace \$16.85. This is a very good indication that the scarcity is not local. While this may be merely temporary, yet some of our largest producers are of the opinion that the market is on the eve of a firm advance, especially in standard brands of Foundry Irons. While the Eastern market is just now the most favorable point to which our producers can ship, yet the inquiries that have been made seem to come from all over the North, and do not appear to be confined to any one particular point. The demand from the Southern furnaces is decidedly on the increase. This is the result of a number of new furnaces being established and the enlargement of many of the old ones, and the day cannot be far distant when the demand from the Southern furnaces will be an important item for the furnaces to turn their attention to. In fact, at the present time there are some two or three who are disposing of most of their products in this direction.

St. Louis.

St. Louis, July 4, 1887.

Pig Iron.—Some large orders have been placed during the past week at prices a trifle less than those quoted 10 days ago, and commission men report inquiry very heavy for standard foundry grades, especially for Southern Coke Iron, which is the basis of most mixtures.

Southern Coke No. 2 Foundry	19.00 @ 20.00
No. 1 Mill	18.00 @ 18.50
No. 2 Mill	17.00 @ 17.50
Bessemer	22.00 @ 23.00

Barb Wire.—Not very active, selling at about \$3.50 for Painted and \$4.25 for Galvanized; but buyers would not have much trouble in placing large orders at, say, \$3.25, Painted, and \$4.00 for Galvanized. Some sales are reported to have been made at the latter figures.

Steel Nails.—The market is good, and buyers seem to realize that Nails are cheap. Brokers and dealers say that sales are much easier to make at the advance than they were at the old figures. Wheeling Steel Nails are offered as low as \$2.27½, St. Louis, and considerable selling through brokers.

Old Rails.—There is considerable inquiry for eastern shipment, especially for fall delivery, but offers hardly meet buyers' views. Prices are at East St. Louis, \$22.50 @ \$22.75.

Old Wheels.—There is considerable demand but none offering. Prices are nominally \$20.50 @ \$21.00.

Scrap.—Wrought Scrap is dull, considerable coming in and the demand is limited, prices about 65¢ @ 70¢ per 100 lb. Cast Scrap is also weak, owing partly to the fact that most of the cable contract is filled or is contracted for. Prices 65¢ @ 85¢ per 100 lb, according to quality.

Cincinnati.

CINCINNATI, July 4, 1887.

A firmer and more confident tone has prevailed in the Pig-Iron market during the past week, with the tendency toward higher prices, although as yet no advance of importance has been realized. The settlement of the Iron workers' differences without the last resort—of a strike—has acted as a sustaining influence, and has been the cause of renewed buying by rolling mills and agricultural works. The Coke strike is not yet settled, and as a natural sequence there is a gradual but steady decrease in stocks, consumption continuing quite heavy. There has been a good run of orders for small lots of mill grades, and some round lots, too, have been sold for early fall delivery. Foundry grades have been comparatively quiet. It is difficult to obtain Southern Coke Iron at current rates, but Northern Coke Iron has been obtainable and a number of contracts placed. There have been moderate transactions in Lake Superior Iron at previous prices. The demand for Charcoal Iron has increased materially. Western Malleable works are reported to have placed contracts for their entire season's supply, and agricultural works are preparing to follow this example, being stimulated by the rapid reduction of stocks. The affairs of E. L. Harper & Co. have cut but a small figure in the market. Considerable difficulty has been experienced to obtain a suitable trustee who would accept the responsibility and labor involving upon the trusteeship of their tangled affairs. The current cash price for Pig Iron, f.o.b. cars at Cincinnati, are as follows:

Charcoal Foundry.	
Hanging Rock, No. 1	\$23.00 @ \$24.00
Hanging Rock, No. 2	21.00 @ 22.50
Southern No. 1	21.00 @ 22.00
Southern No. 2	20.00 @ 21.00

Coal and Coke Foundry.	
Ohio Soft Stonecoal, No. 1	20.00 @ 20.50
Ohio Soft Stonecoal, No. 2	19.00 @ 19.50
Southern Coke, No. 1	20.00 @ 20.50
Southern Coke, No. 2	19.50 @ 20.00
Southern Coke, No. 3	18.00 @ 19.00
Ohio and West Pennsylvania Coke, No. 1	21.00 @ 22.00
Ohio and West Pennsylvania Coke, No. 2	20.00 @ 21.00

Forge.	
Strong Neutral Coke	18.00 @ 18.50
Mottled	17.00 @ 17.25
Southern Coke	18.00 @ 19.00

Car-Wheel and Malleable Irons.	
Southern Car-Wheel	25.00 @ 27.00
Hanging Rock, Cold Blast	26.00 @ 27.00
Hanging Rock, Warm Blast	24.00 @ 25.00
Lake Superior Malleable	24.00 @ 25.00

Old Rails and Wheels.—There has been a more active demand for Old Rails, and a better inquiry for Wheels, but it has led to little business. Old Rails are quotable at \$23.50, and Wheels at \$21.50 @ \$22 per ton.

Nails.—Have been in fair demand and firmer. Iron, 10d. @ 60d., selling at \$2.10 per keg, and Steel at \$2.15 @ \$2.20 per keg, and other sizes at proportionate rates.

Manufactured Iron.—There has been a good demand for Structural Iron, and a firm tone has continued to prevail. We quote: Bar Iron, 2½; Charcoal Bar Iron, 3½; Sheet Iron, Boiled, Nos. 10 to 27, 2½ @ 3½; Sheet Iron, Charcoal, Nos. 15 to 25, 3½ @ 4½ per lb.

Cleveland.

CLEVELAND, July 4, 1887.

Iron Ore.—Prices for Iron Ore continue very firm owing to the unusually high vessel rates and to the fact that fully three-fourths of the contemplated output of the mines was sold early in the season. The Ore handlers on the docks have returned to work and shipments to the furnaces have increased in consequence. Ore dealers and furnacemen, too, estimate that the strike will have th

effect of considerably reducing the total receipts for the year. Sales for the past week have been limited, the heaviest business reported by any of the local companies not exceeding 5000 tons. A limited amount of Ore has been sold at the mines, but mainly for Chicago delivery. Few orders are expected from the Lake Erie distributing points while vessel rates remain so exorbitantly high. Charters have been made during the past week at \$1.65 from Escanaba—a rate at which vessels can well afford to bring Ore from Ashland. Furnacemen do not seem greatly disturbed by the situation. Quotations are:

No. 1 Specular and Magnetic Ores, Bessemer quality	\$6.50 @ 7.00
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	6.00 @ 6.50
Red-Hematite Ores, Bessemer quality	5.75 @ 6.00
Red-Hematite Ores, Non-Bessemer quality	5.00 @ 5.50
Menominee Range Ores, Bessemer quality	5.50 @ 6.25
Menominee Range Ores, Non-Bessemer quality	4.75 @ 5.25
Gogebic Range Ores, Bessemer quality	5.50 @ 6.00
Ores for Mill Use	6.00 @ 7.00

Pig Iron.—There is a most active demand for Bessemer Irons. The better buying movement in all grades of Pig Iron which the dealers have anticipated for several weeks seems to have come in earnest. Sales for the past six days show a large increase over the business of the preceding week. Buyers who refused certain Irons at the ruling price two weeks ago are now in the market ready to buy. The light production and liberal consumption of Iron seems likely to still further improve the condition of the market. The following are f.o.b. cash prices in this market:

Nos. 1 to 6 Lake Superior charcoal	\$24.00 @ 24.50
No. 1 Strong Foundry, Bessemer quality, ½ ton	21.35 @ 21.85
No. 1 strong Foundry, ½ ton	20.85 @ 21.35
No. 2 strong Foundry, ½ ton	19.85 @ 20.35
No. 1 American Scotch, ½ ton	21.35 @ 21.85
No. 2 American Scotch, ½ ton	20.85 @ 21.35
No. 1 Soft Silvery, ½ ton	20.00 @ 21.00
Maioning and Shenango Valley Neutral Mill Irons, ½ ton	18.85
Maioning and Shenango Valley Red Short Mills, ½ ton	19.85

Scrap.—The Scrap Iron market seems almost perfectly lifeless. Old Rails are quoted nominally at \$24, but have sold for \$23.50. Old Wheels remain at \$21, with only a limited business reported.

Nails.—Iron Nails seem to have struck bed rock at \$2 per keg, and Steel Nails refuse to go below \$2.10.

Louisville.

LOUISVILLE, KY., July 4, 1887.

The demand for Pig Iron during the past week has been better than for two weeks previous, and a greater number of sales—mostly for Foundry grades—have been booked. One feature of the market that has been quite noticeable has been that in most cases offers made by buyers at close figures have been declined, and buyers have had to come to the views of sellers before transactions have been closed. In some cases transactions have been closed by a division of the difference. A summing up of the sales and circumstances attending show a firm tendency. There are still some lots of iron on the market owned by speculators, or by consumers purchased in excess of their wants, and these lots, as a general thing, can be bought at our inside quotations. There are many grades, however, that are not included in these lots, and these grades, when sold, must come from furnaces. The furnaces continue to be generally largely sold ahead and are asking outside figures. Sales have been made in consequence for furnace account for brands and grades of iron needed for buyer's mixture at 50¢ @ \$1 per ton over relative prices asked for the speculative lots. This and the increased demand have induced some of the speculative lots to be withdrawn, and any considerable demand now would undoubtedly advance prices all along the line. The continued activity in railroad building and the scarcity of some brands and grades are giving renewed tone to the market, the monthly report of the Western Pig-Iron Association showing a decrease in the stocks in first hands from May 1 to June 1, and is the only instance of this kind for several years, the reverse having been the case. Altogether, the indications are for a better market and better prices. Another instance of strength is the fact that these favorable indications come immediately after the excitement in Chicago, Cincinnati and New York, attendant upon the collapse in wheat, coffee and stocks. We quote for cash in round lots as below:

Southern Coke, No. 1 Foundry	\$19.50 @ \$21.00
" " " " "	18.50 @ 19.00
" " " " "	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry	19.00 @ 20.00
Southern Charcoal, No. 1 Foundry	21.00 @ 22.00
Silver Gray, different grades	17.00 @ 18.50
Southern Coke, No. 1 Mill, Neutral	17.50 @ 18.00
" " " " "	17.00 @ 17.50
" " " " "	17.00 @ 17.50
" " " " "	18.50 @ 19.50
White and Mottled, different grades	16.00 @ 17.00
Southern Car-Wheel, standard brands	23.00 @ 26.00
Southern Car-Wheel, other brands	22.00 @ 23.00
Hanging Rock, Cold Blast	25.00 @ 26.00
Hanging Rock, Warm Blast	24.00 @ 25.00

W. B. BELKNAP & Co., Louisville, report as follows, under date of July 4, 1887: Just what the general effect of the signing of the scale for the coming year will be is not yet made manifest. It would seem to indicate that the mills had fair business, and yet it is very doubtful if the manufacturers will be able to add to their selling margins the additional cost for labor that they have agreed to give. Now that all scarcity of product is removed, buyers are somewhat apathetic and are reducing their orders to

moderate amounts again to what is needed for immediate use only. This same will apply to almost all the products of Iron which have been bought quite freely for the past 30 days in anticipation of possible stoppage. The demand for consumption, however, is unquestionably good and trade seems to be in a healthy condition, taken all in all. The drought affects things somewhat unfavorably, locally, but it is not sufficiently severe yet to make serious trouble.

Bar Iron.—Is fairly firm, and as the mills declined July business up to the last of June, it is presumed will be in good supply, as manufacturers are bound to seek new orders.

Sheet Iron.—Is held quite firmly by the mills. There is a good deal of inquiry for the light gauges, but not much disposition to contract at the prices made by the association. Galvanized Sheet is low and selling freely.

Steel.—Cast Steel is jobbing in fair lots, inasmuch as contractors are pushing their work during fair weather. The grades of Common Steel, Tire, Machinery, and Flow are being well sustained as to price. There are rumors of combinations to maintain the price of Flow Steel and finished shapes for the coming season.

Nails.—There has been a material advance in Nails of late, but as many of the mills declined July business altogether, it is probable they may come into the market with product to sell, which may prevent further appreciation.

Wire.—Is very low, both Plain and Barbed. The demand is just picking up once again, as part of the harvesting is past, and we look for fair business.

Coal Market.

Summer dullness prevails in the Anthracite Coal trade, but renewed activity is looked for by August 1; meanwhile, prices are held up nearly or quite to the circulars, and no advance in prices before August is supposed to be probable. In Philadelphia no orders for August delivery are not accepted at the prices now current. There is rather more inquiry in the Eastern trade, and shipments are delayed by the scarcity of vessels. Quotations are unchanged: Free-Burning White Ash, Broken, \$3.55; Egg, \$3.80; Stove, \$4.15; Chestnut, \$4; Pea, \$3; Hard White Ash, Broken, \$3.85; Egg, \$3.95; Stove, \$4.15; Chestnut, \$3.85; Pea, \$2.75. The Bituminous trade is unchanged.

The Reading Railroad Company have opened up a new route for Anthracite Coal, by which all loaded cars over the Philadelphia and Erie Railroad are to be returned to the point of shipment laden with Anthracite Coal. The new route will be via Williamsport and Elmira, and thence by the New York, Lake Erie and Western Railroad to Buffalo and the West as far as Chicago. This route will secure to the Reading a valuable outlet for a large portion of its Anthracite tonnage. The tariffs over the new route are now in force. It is reported from Scranton that the Pennsylvania Railroad has bought ground there for terminals, intending to run a line up from Wilkesbarre.

The total amount of Anthracite mined thus far since January 1 is 16,096,000 tons, an increase of 1,618,000 tons compared with last year. The Pennsylvania Railroad carried 5,034,916 tons of Coal, an increase of 1,130,556 tons, compared with 1886.

Several hundred of Pinkerton's men are watching movements in the Conellsville Coke region.

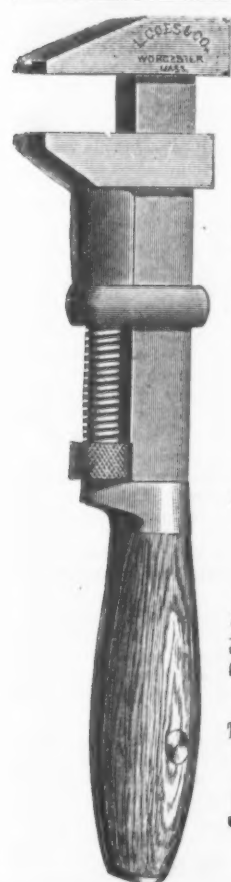
Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	per lb.	\$0.07
Light Copper	"	06
Copper Bottoms	"	06
Brass, Heavy	"	06
Brass, Light	"	06
Composition	"	06½
Lead, Heavy	"	\$0.09½ @ 04
Tea Lead	"	08½ @ 03½
Zinc	"	08½ @ 03½
Wrought Iron	per ton	22.00 @ 00
Light Iron	"	12.00 @ 13.00
Stove Plate Iron	"	12.00 @ 10.00
Machinery Iron	"	12.00 @ 16.00
Grate Bars	"	7.00 @ 00
Old Rubber	"	01½ @ 05
White No. 1	"	03½ @ 03½
White No. 2	"	01½ @ 01½
Canvas, Linen, No. 1	"	01½ @ 01½
Canvas, Cotton, No. 1	"	01½ @ 01½
Canvas, No. 2	"	009½ @ 02½
Seconds	"	01 @ 01½
Soft Woollens	"	00½ @ 07
Mixed Rags	"	01 @ 01½
Gunny Bagging, No. 1	"	01 9-16 @ 01 11-16
Butte	"	01 9-16 @ 01½
Book Stock	"	007½ @ 01½
Newspapers	"	007½ @ 01
Waste Paper	"	004 @ 004½
Kentucky Bagging	"	004½ @ 004½
Kentucky Bale Rope	"	004½ @ 04
Kentucky Bagging	"	004½ @ 0008

The recent wreck of the British steamer Victoria in the English channel near Dieppe has given rise to a discussion of the transmission of sonorous signals in the atmosphere, a problem studied some years ago by Professor Tyndall. M. Fizeau, the well-known French physicist, has communicated a paper to the French Academy of Sciences in which he shows that there is sometimes a tendency for rays of sound proceeding from a source to curve upward, and produces what he calls a mirage of sound. This takes place when the temperature of the lower layers of the atmosphere is higher than that of the upper layers, as is frequently the case over the sea, especially during the night or in periods of fog. He suggests that special experiments should be made on this matter.

In our description last week devoted to "Naphtha Launch Engines" we accidentally omitted the address of the builder, the Gas Engine and Power Company. It is 131st street and Brook avenue, New York.



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GENUINE IMPROVED
Knife Handle
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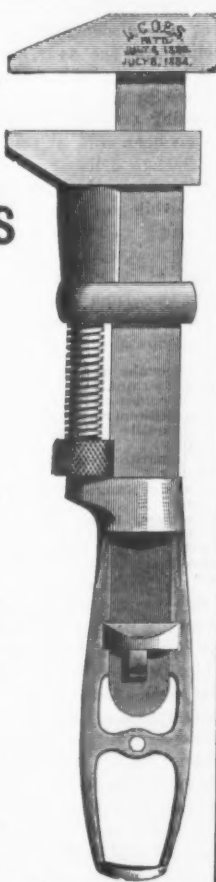
ESTABLISHED IN 1830.



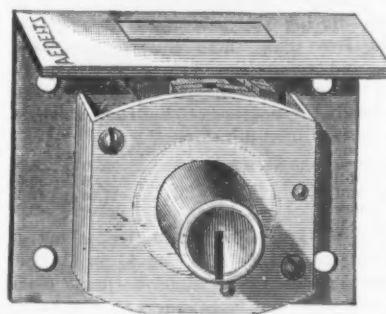
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KNIFE HANDLE, showing Malleable
Iron Frame and Shank of Bar keyed
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Straight Bar, Extra LONG NUT
FOR SCREW IN JAW

The Best Made and Strongest Wrench in the Market
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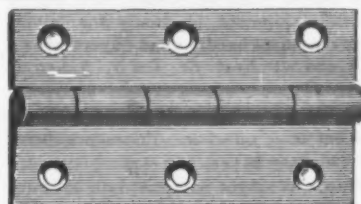
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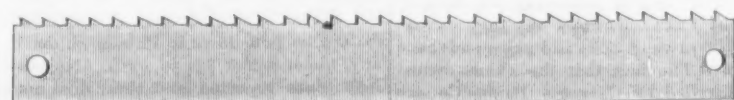
BUTCHER SAW BLADES

if he will take the trouble to show the Star Blades to the Butchers and per-
mit them to try their quality. There is not a single place where these Blades
have been used that they have not taken and held the market. They can be
sold for 10 Cents each, and that is less than the cost of filing a common
saw. They are so hard that one will cut three or four times as long as the
saws now in use without filing. As these Saws are not to be filed, and as
one only lasts a few months before getting dull, a great many of them are
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will send on demand.

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STAR BUTCHER ★ SAW BLADES.

Length.	Width.	Gauge.	Teeth to Inch.	Per Dozen.
14 and 16 in.	1 in.	24	9 1/2	\$1.08
18 " 20 "	1 1/4 "	24	9 3/4	1.20
22 " 24 "	1 3/4 "	24	9 1/2	1.32



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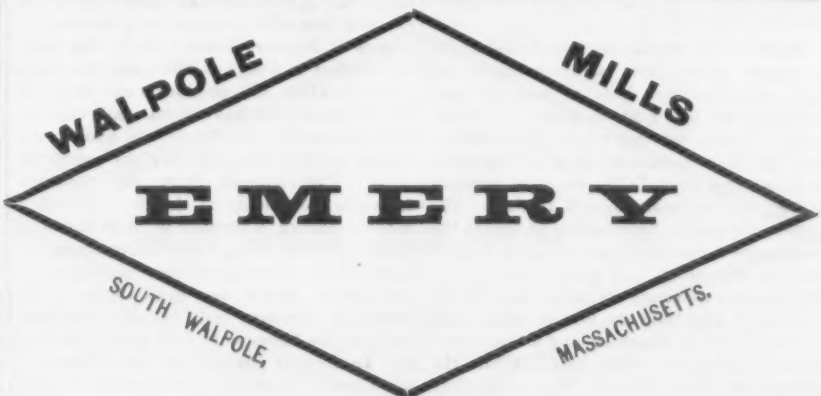
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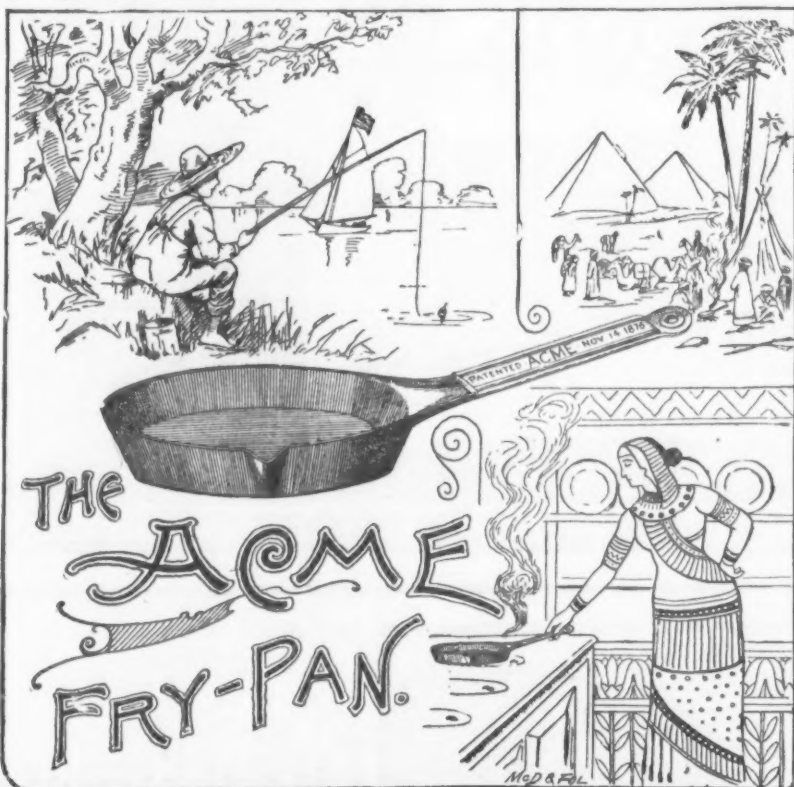
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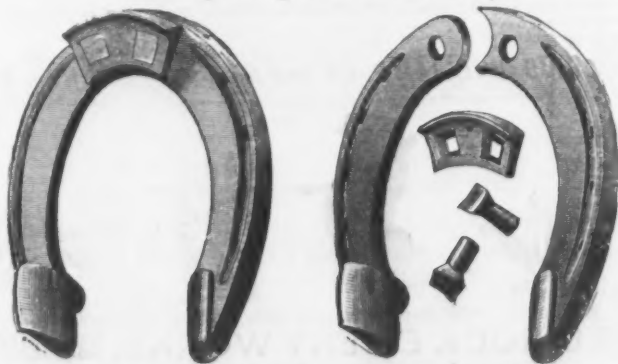
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MANUFACTURING.

Iron and Steel.

All the blast furnaces of the Pennsylvania Steel Company, of Steelton, Pa., with the single exception of No. 2, are in blast, and showing a large production. No. 2 furnace will be blown in as soon as a supply of coke can be had.

The Pittsburgh Steel Casting Company, of Pittsburgh, a candidate for the contract for making the three "steel-cast, rough bored and turned 6-inch high power rifle cannon of domestic manufacture," for which an appropriation of \$25,000 was made at the last session of Congress.

Lochiel Furnace, of the Lochiel Furnace Company, of Harrisburg, Pa., has been leased by Robert H. Coleman, proprietor of the Colebrook and Cornwall Anthracite Furnace, at Lebanon, Pa., and will be operated in connection with those furnaces. It will be put in blast as soon as a supply of coke can be had.

A dispatch from Scranton, Pa., dated July 1, says: "The Jersey City Steel Works, through Scranton representatives, yesterday purchased seven acres of land in the Second Ward in this city, on which it is proposed to erect works for the manufacture of mechanic steel and fine tools. The land was purchased from the Delaware, Lackawanna and Western Company, the price paid being \$5000 per acre. The Jersey City Corporation have been negotiating for the purchase of this property since last October. Yesterday the option closed, and the bargain was sealed. The papers were immediately made out and the property paid for, spot cash. The work of erecting the building will begin at once. Nine hundred men will be employed at the start. This will give the steel business in this city an additional impetus, and will, of necessity, add greatly to the city's position as an industrial center."

The South Chicago Works of the North Chicago Rolling Mill Company, which suspended operations for about one week on account of the lack of coke, resulting from the strike in the coke region, are now in full blast, having received a supply of coke adequate for their purposes.

The employees of the Reading Iron Works, at Reading, Pa., decided not to accept the reduction of 10 per cent. made recently, and as a result the entire works are now idle, throwing 2000 men out of work.

Falcon Furnace, owned by Brown, Bonnell & Co., at Youngstown, Ohio, after a shut down of several weeks for repairs, was successfully blown in on the morning of the 1st inst.

A dispatch from Phillipsburg, N. J., dated June 29, says: "All of the Andover Iron Company's furnaces below here are to-day out of blast, and the company suffer a loss of about \$60,000. No. 1 became chilled a few days ago. No. 2 worked badly and was this morning blown out to be torn down and rebuilt. No. 3 is being rebuilt and was to take the place of No. 2 had the latter held out the balance of the year."

The Montour Rolling Mill, at Danville, Pa., resumed work on the 28th ult., after having been shut down five weeks on account of wage troubles. The mill employs 350 men.

The Sharon Steel Casting Company, of Sharon, Pa., announce to the trade that they are now ready to receive orders for their line of goods for August delivery. The plant of the above company is located at Sharon, and is equipped with the best machinery that could be obtained, which, with the superior force of workmen that has been secured, will enable the company to produce steel castings of an excellent quality. The works are also equipped with a 25-ton traveling crane furnished by the Morgan Engineering Company, of Alliance, Ohio. The works will have facilities for producing steel castings from the smallest size made up to 15 tons in weight. The parties interested in the enterprise are Samuel McClure, F. H. Buhl, Joseph Riddle and Daniel Eagan, all of Sharon, and B. F. Watkins, of Alliance, Ohio, who was formerly superintendent of the iron and steel foundries of the Morgan Engineering Company, and the Solid Steel Company, of Alliance, and was also connected with the Cambria Iron Company, for 12 years as superintendent of the iron and steel foundries of that company. The works will be under the general management of Mr. Eagan, while Mr. Watkins will superintend the running of the same.

The rolling mill at St. Paul, Minn., is now being operated by a new corporation known as the Capital City Rolling Mill Company. Since the mill was started it has passed through several changes, having first been operated by Morgan, Williams & Co., then by the Northwestern Rolling Mill Company, and now by a third combination of owners. It is in active operation at present, but those who are running it say there is no certainty of its continuing at work.

The Portage Iron Company, Limited, of Duncansville, Pa., is about to add to their already extensive plant another new building, which will be 112 feet in length. It will be used for shearing iron and other purposes.

The Ohio & Western Coal and Iron Company, of Columbus, Ohio, have closed a contract with a prominent firm in Pittsburgh for the completion of their two blast furnaces at Floodwood, Ohio. These furnaces are to be raised about 10 feet, giving dimensions of 75 x 17, and will be finished with all of the latest improvements in the way of blast-furnace machinery. Having ample heating, steam and blowing power, it is calculated the output of each furnace will be 125 tons of iron per day when using rich ores and good fuel.

The Illinois Iron and Bolt Company, of Carpentersville, Ill., are putting up a new building 52 x 128 feet in size and one story high for a forge shop, and are getting new machinery for it.

All the furnaces of the Cambria Iron Company, at Johnstown, Pa., have been banked, except one. The company's coke ovens, in

the Connellsville region, have been shut down for some time, and enough fuel from other sources cannot be obtained to supply the furnaces.

Machinery.

William Tod & Co., of Youngstown, Ohio, have an order for another of their Hamilton blowing engines for a blast furnace in southern Ohio. They also report trade larger than ever on the Porter-Hamilton rolling-mill engine.

A mutual aid society, with 130 members, has been organized by the employees of the Westinghouse Machine Company, of Pittsburgh, with the following officers: John Jackson, president; Joseph Schleicher, vice-president; John May, treasurer, and Larimer W. Jones, secretary.

A new company is being organized in Pittsburgh for the purpose of holding and selling patent rights for electric railway purposes. It is to be called the Overhead Conductor Electric Railway Company, and has a capital stock of \$300,000. Among those interested in it are George Westinghouse, Jr., John Caldwell, H. H. Westinghouse, Frank L. Pope and Thomas B. Kerr. The company's motors, or conductors, instead of being under ground, are to be overhead like telegraph wires. The Observatory Hill electric road and the Mount Oliver electric road will, it is said, operate the patents of this company. It is claimed that this method of conductors is a signal advantage over the underground method, as it preserves them much longer.

A meeting of the creditors of Whitely Fassler & Kelly, mower and reaper manufacturers, of Springfield, Ohio, whose suspension was noted in our last issue, was held on the 28th ult. at Springfield. There was a large representation of capitalists present, and the meeting, which terminated at 4 o'clock, was harmonious, and a disposition to give the firm every opportunity was manifested. After claims were filed, Colonel A. L. Conger, of Akron, was made chairman, and J. D. Culbertson, of Wheeling, secretary. The result of the meeting was the adoption of the following: "Resolved, That we approve the action of the Champion Bar and Knife Company in applying for a receiver for Whitely, Fassler & Kelly, and of the appointment of William N. Whitely as such receiver, and that M. Churchill, Zanesville; Alexander Gebhardt, Dayton; A. L. Bushnell, city; Walter Petter, Boston; Amos Whitely, city, be, and they are, appointed a committee to examine into the affairs of the Whitely firm and to report a plan for their adjustment and for the return of their property to Whitely, Fassler & Kelly, and the termination of the receivership, and the said committee be directed to make a preliminary report by mail, within 30 days, and to call a meeting or meetings of the creditors before September 1, next, at such times and places as they may deem expedient." Means have been provided for the company to continue their business as usual.

A company have been organized at Chicago under the name of the Chicago Automatic Boiler Company, for the manufacture of a boiler of a new design. M. Cochran Armour is president of the company, W. S. Armour is secretary and treasurer, and G. A. Colby superintendent. Their office is in the Adams Express building, No. 185 Dearborn street.

The Morris Machine Works, of Baldwinville, N. Y., have just issued a catalogue illustrating and describing their new automatic engine. It embraces an extensive table of sizes, weights, speeds and steam pressures.

We have received from the A. Plamondon Mfg. Company, 57 to 67 South Clinton street, Chicago, a copy of their catalogue for 1887, which has just been issued, making their 29th annual catalogue. The company's manufactures embrace shafting, pulleys, hangers, couplings, machine-molded gearing and machinery for flour mills, grain elevators, distilleries, breweries, &c. The catalogue embraces 157 pages, devoted to descriptions and prices of the various manufactures, accompanied by a telegraphic cipher code to cheapen the cost of ordering irregular or odd sizes by wire. The company call special attention to their gear list, which they say is the largest bona-fide gear list ever published in this country, containing almost every sized gear needed. They also state that they have three gear-molding machines, which make perfect gears of any size or kind, and three gear-dressing machines for dressing both iron and mortise wheels.

The Foss Mfg. Company, of Springfield, Ohio, have secured an order from The Southern Cotton Oil Company, of Charlotte, N. C., to furnish their scientific oil cake crushers and grinders for all the new oil mills to be erected in the South. This is the largest order ever given at one time for such machinery, and involves the largest amount of money. It will require an extra force of men to build the crushers in time for delivery, which will be early the coming fall.

The Wainwright Mfg. Company, of Boston, report shipments of their corrugated tube exhaust feed-water heaters to the following places during the month of June: four to Boston; two to New York City; one each to East Buffalo, N. Y.; Whitman and North Adams, Mass.; Cumberland Mills, Dexter and Bar Harbor, Me.; St. Joseph, Mo.; Decatur, Ill., and Weimar, Texas.

Messrs. Byram & Co., of Detroit, Mich. the exclusive manufacturers of the Colliat cupola furnace, have recently made shipment of these furnaces to the Fort Worth Iron Works, Fort Worth, Tex., and the Dustin & Hubbard Mfg. Company, Oakland, Me., and will soon ship their second furnace this season to Messrs. Bement, Miles & Co., of Philadelphia, Pa.

The Chalmers-Spence Company, of New York, were recently awarded a large contract from Boston for their non-conducting covering. The specifications call for some 25,000 feet, or nearly 5 miles, of all asbestos pipe covering.

The Silver & Deming Mfg. Company, of Salem, Ohio, manufacturers of pumps and hydraulic machinery, inform us that they have recently built an addition to their

foundry, which will increase the capacity about 30 per cent. They have also increased their facilities in other directions by adding some new, special machinery, and have an average increase over last year's capacity of about 20 per cent. in the various departments. They further inform us that Messrs. Henion & Hubbell, of 55 and 57 North Clinton street, Chicago, Ill., have been recently appointed general Northwest agents for the sale of their goods.

The Portland Locomotive Works, of Portland, Me., are building 20 locomotives for the Boston and Maine Railroad Company, and are giving employment to 350 men.

The Taunton Locomotive Works, at Taunton, Mass., will shortly commence the erection of a large addition to their present plant. The new building will be of two stories, and will give about 3000 square feet of extra room, extending 75 feet on High street and into the yard 150 feet.

The Webster, Camp & Lane Machine Company, of Akron, Ohio, have received an order from the Cambria Iron and Steel Company, of Johnstown, Pa., for their Penn Iron Mines, at Vulcan, Mich., for a plant of hoisting machinery consisting of two band friction hoisting drums, 12 feet diameter, 72 inch face, having capacity for 2000 feet of 1½ inch of wire rope. The drums are driven by a 28 x 48 inch automatic engine of 350 horse-power. The aggregate weight of the plant is 105 tons, and the machinery is to be in place by October.

The Link Belt Machinery Company, Nos. 11 to 23 South Jefferson street, Chicago, Ill., have sent us a very interesting catalogue devoted to their various forms of link belt, sprocket-wheels, pulleys and improved appliances for handling materials. It embraces 176 pages and is profusely illustrated.

The Hagerstown Steam Engine and Machine Company, of Hagerstown, Md., have sent us a number of circulars and a catalogue devoted to their different forms of agricultural machinery, embracing traction, portable and stationary engines, threshers, corn-shellers, clover hullers, saw mills, &c. A large number of illustrations are given, together with descriptive particulars.

We are in receipt, from the Blymyer Iron Works Company, of Cincinnati, Ohio, of three catalogues, the latest bearing the date of March 1, 1887. It is mainly devoted to sorghum and imphee sugar canes; their culture and manufacture into syrup and sugar, and will be found throughout of the greatest interest. Illustrations are given showing different varieties of sorghum sugar canes, together with descriptive particulars. Sorghum culture, syrup and sugar making, and the various details connected with the subject, are treated in successive chapters, and the whole will be found of great interest, even to those not peculiarly interested in the subject. One of the other catalogues is devoted to sugar cane machinery, steam engines, &c. It is profusely illustrated, and contains the information ordinarily found in trade publications. The third catalogue is devoted to ice-making machinery, and illustrates and describes the machines formerly made by the company, and now in the hands of the Cincinnati Ice Machine Company, of Cincinnati.

Hardware.

The works of the New Castle Wire Nail Company, at New Castle, Pa., are reported to be employing 200 hands and turning out 500 kegs of wire nails daily. They are shipping as far east as Massachusetts and as far west as Portland, Ore.

The Wheeling Hinge Company, of Wheeling, W. Va., are now building a two-story brick factory for the accommodation of their strap and T-hinge machinery. The building will enable them to place their machinery to the best advantage, and the addition of new and improved machinery will add largely to their capacity for producing these goods. When they start up it is the intention to make all their hinges of soft steel.

The Clinton Wire Cloth Company, Clinton, Mass., are enlarging their works by the erection of new buildings and enlarging of others. The changes now in progress will add, it is estimated, 10,000,000 feet to its present capacity for weaving wire window screen cloth. An additional story is being put on its No. 3 mill, adding 20,000 square feet floor surface. This will be devoted to looms for weaving window screen cloth, some of the looms being ready to start as soon as the building is completed. As the walls are up but little is to be done except putting the roof on. The old front has been taken down and a handsome new front of brick, with terra cotta and granite trimmings has taken its place. A new storehouse is being erected for the storage of wire and manufactured goods. It is on the line of the Old Colony Railroad, so that cars may be loaded and shipped away with quick dispatch. The floor space available for storage is about 40,000 square feet. The building is to be four stories high and will be as nearly fire-proof as possible. A new galvanizing plant is to be erected this season, which it is intended shall be a model for the work for which it is designed, and no expense will be spared in its construction. It will contain fuel and metal houses, tank rooms and galvanizing pits sufficient for 500,000 feet of netting per day. While this is in excess of the present demand the company are now providing for a large increase of their galvanizing business, following out their policy of popularizing whatever they manufacture by producing it at low cost.

The Kelly Axe Mfg. Company, Louisville, Ky., have finally completed their new axe and hatchet factory, at a cost of over \$100,000. The business takes in one entire square of 125 feet, the buildings, built in the most substantial way of brick and iron, covering three-fourths of the space. A private switch for receiving and shipping freight connects the works with all the railroads entering the city. The machinery is all of the most improved pattern. Two batteries of boilers, which can be operated singly or together, furnish the steam power, at an expense of \$4.64 per day of 10 hours' work, the consumption of fuel being 6 tons of slack coal, at a cost of 74 cents per ton. Each department is operated by an independent automatic en-

gine, and a stoppage of one does not affect the others. The capacity of the work is 40,000 to 50,000 dozen axes and hatchets per annum.

The Moore & Barnes Mfg. Company, Phoenix, N. Y., near Syracuse, are moving into their new factory, a capacious and well-arranged building. It is of brick, 100 x 40, two stories, with iron roof, well lighted and of handsome appearance. It will be operated by water power from the river, but two boilers are provided in case of necessity. It will be illuminated by electric light. With these increased facilities the company will be in a position to furnish more promptly its varied line of vices, anvils, sash, plumbers' and safety chains, cove trough hangers, &c., a line to which it is expected that further additions will soon be made.

Local file-makers, says the St. Louis Age of Steel, are not so busy as heretofore. One factory is still making full time, another half time, while a third is barely "doing something." The fourth has been diverted to the production of hominy knives or beaters, and is pushing this class of trade for all it is worth. Heel files for shoe factories are made to some extent at local works, and afford a pretty good margin of profit. This is because they are extremely difficult to cut. For a set of three \$5 is charged.

The Hoff, Renner & Adam Mfg. Company, Cincinnati, Ohio, about nine months since secured the large three-story brick premises located on Kinney street, near Spring Grove avenue, measuring 200 x 80 feet, which has in the interval been entirely renovated and remodeled to suit the requirements of a manufactory for their crimped-bottom one-piece Coal Hods. Through vexatious delays on the part of the builders of the special machinery ordered by the company they were put to serious loss and inconvenience in being unable to fill orders, which they were led to accept under the assurance that the machinery would be completed when promised. This machinery has been received, and is now in perfect operation, enabling the company to turn out 2000 complete Hods per day of 10 hours. The principal advantage claimed for this Hod is that the body and bottom are of one single piece of sheet steel; the bottom, in the course of manufacturing, is crimped so as to form a triple thickness. This, together with the novel method of attaching the foot without the use of rivets, combines, it is claimed, to make it very substantial and neat in appearance. The first floor of the new factory is devoted to engine and boiler rooms, and jannapping department. One-half of the second floor (80 x 100 feet) is occupied by the special machinery used in the manufacture of the Hods. The remainder of this floor, 80 x 100 feet, is used for shipping, receiving, weighing and office purposes, while a portion of the third floor is used as a general metal worker's and machine shop, and the balance for the storage of steel used in the manufacture of the Hods and the finished product. A galvanizing department has been added to the establishment, which is located in a separate building, 75 x 30 feet, and has a capacity for galvanizing 800 Hods per day. A reorganization of the company was effected on the 24th ult., John Garlick retiring from the office of vice-president, and R. Park succeeding him in that position, Peter Renner being re-elected to the office of president and general manager; Henry Adam, treasurer; Chas. Hoff, superintendent, and N. R. Park, secretary.

Miscellaneous.

The Hostetter Coke Company, of Pittsburgh, capital stock \$6000, was chartered last week, with Thomas H. Given, Charles B. McLean and W. W. Patrick, of Pittsburgh; Jesse H. Lippincott, of New York, and Arthur White, of London, England, as directors.

The Western Pennsylvania Exposition Society, of Pittsburgh, was chartered on the 28th ult., under the act passed at the last session of the legislature giving such companies the right of eminent domain. The directors are J. J. Gillespie, John Bindley, C. O. Scull, M. Rosenbaum, S. S. Marvin, J. T. Speer, A. P. Burchfield, H. J. Heinz, W. F. McCook, E. J. Unger, H. Buhl, Jr., B. Lupton and D. C. Herbst.

At a meeting of the stockholders of the Chartiers Valley Natural Gas Company, of Pittsburgh, held in that city on the 30th ult., the capital stock was increased \$1,000,000, making it \$4,000,000 in all. The money will be used in improving the plant.

Col John A. Price, President of the Scranton Stove Works, who last week started on a voyage of rest and recreation, intending to travel through Western Europe, has never been very active in the councils of the trade, but he has been a successful business man and a fertile inventor. Most of his inventions have had an immediate commercial value, and have been designed to meet a want existing and recognized. In May, 1867, Colonel Price patented an improved low closet, for ranges, and in June, 1868, a design for ranges. In January, 1869, he patented a shute slide for parlor stoves; in June, 1870, a combined door and hearth; in April and July, 1878, the well-known construction known as the Dock-ash grate; in February and March, 1879, other forms of stove grates; in January, 1882, and May, 1883, a valuable improvement in furnace grates; in May, 1883, a range closet; in the same month a bi-mantel shelf; in August, 1883, a further improvement in furnace grates; in September, 1883, a range shelf; in February, 1884, two forms of furnace grates; in December, 1884, and February, 1885, various forms of water heaters; in February, 1885, a furnace grate; in July, 1885, an oven for ranges; in December, 1885, a new furnace construction; in January, 1886, a stove door; in December, 1886, a range closet; in February, 1887, a stove design; in May last a complete, but very simple and effective, water gas producer, and in June a ventilated oven construction in cook stoves. We have not searched the record so carefully as to be sure there are not some omitted from this list, but those enumerated we happen to

know about. Many of these inventions have been largely successful, and have tended materially to promote progress in the arts to which they relate. As Colonel Price is still a young man, and has scarcely reached the period of maximum intellectual activity, we may expect that his record as a fertile and useful inventor will be something exceptional. Indeed it is already.

It is reported that Gen. E. Burd Grubb, of Philadelphia, Robert Garrett, of the Baltimore and Ohio Railroad Company, and Howard Munnikhuysen, of Baltimore, have purchased 2000 acres of the estate of John Carroll, in Baltimore County, Md., paying therefor \$200,000. The tract is underlaid with rich iron ore, which will be mined, and is covered with valuable hard woods.

Among the companies recently securing licenses for incorporation in Illinois are the following: The Eagle Horseshoe Nail Company, of Chicago; capital, \$150,000; organized to manufacture horseshoe nails; incorporators, J. A. Johnson, August Johnson and J. P. Wannerstem. Chicago Natural Gas Fuel and Light Company, of Chicago; for the development and production of natural gas; capital, \$1,000,000; incorporators, C. G. Goodwin, John C. Schurtz, R. A. Wade, A. H. Armour, John T. Nichols, S. R. Burke and George C. Armstrong.

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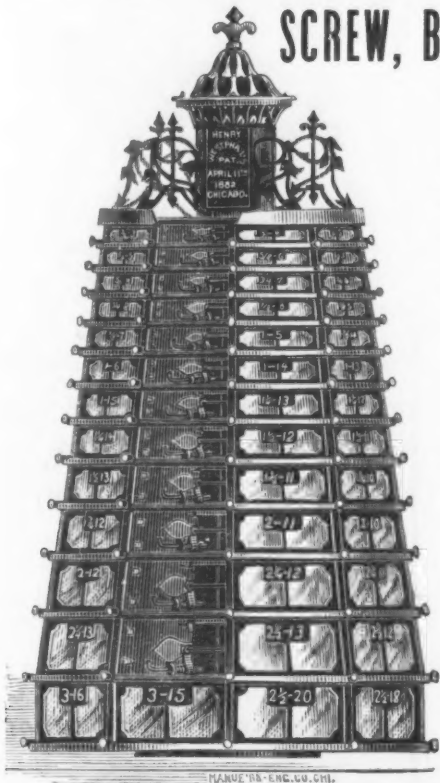
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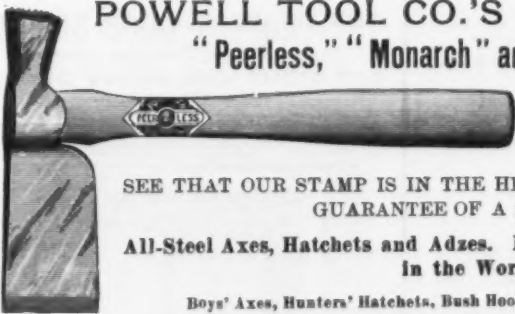
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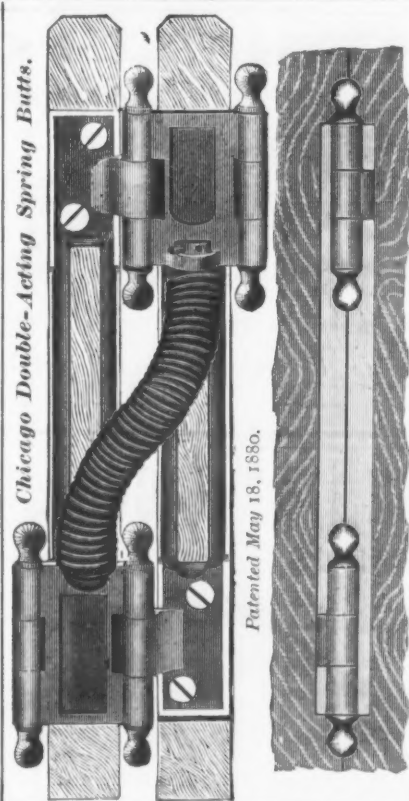
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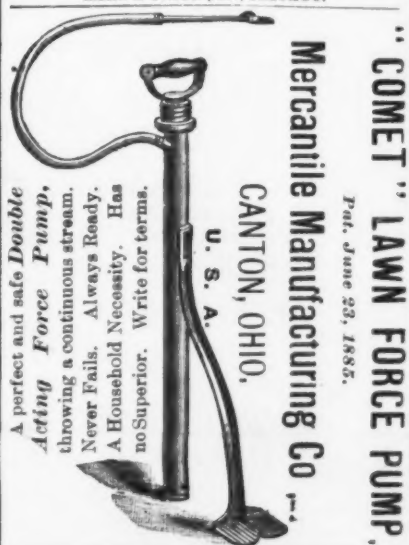
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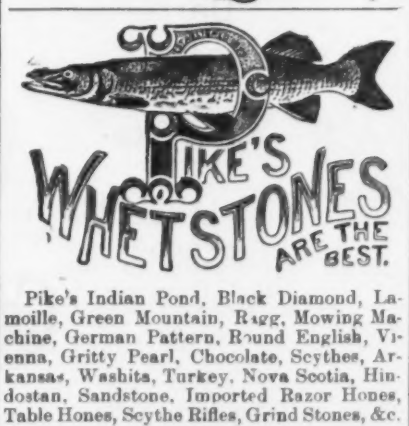


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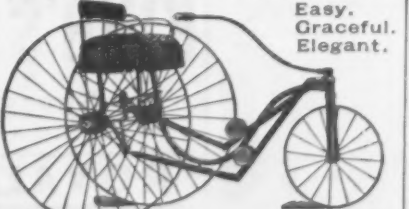
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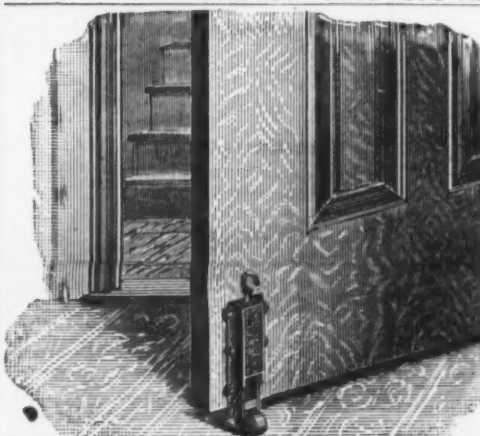
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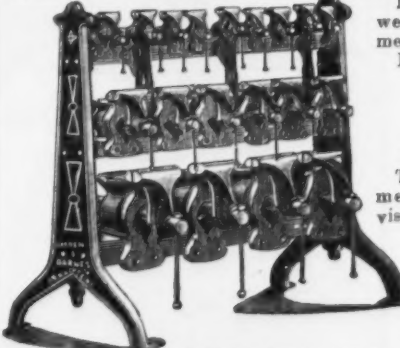
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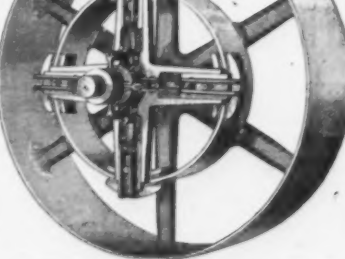
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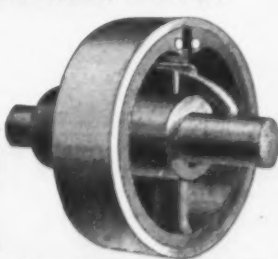
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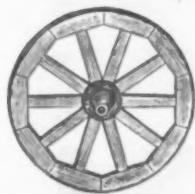


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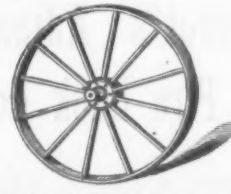
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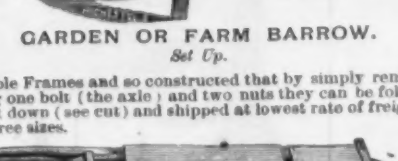
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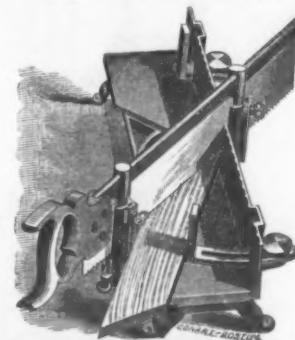
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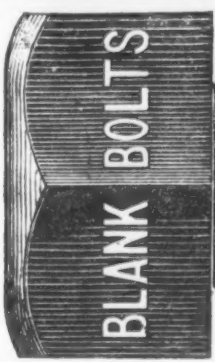
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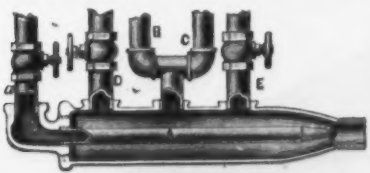
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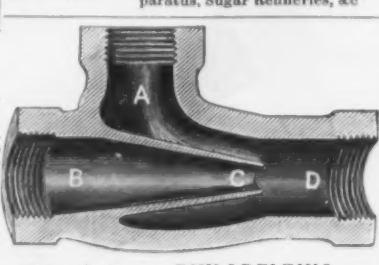
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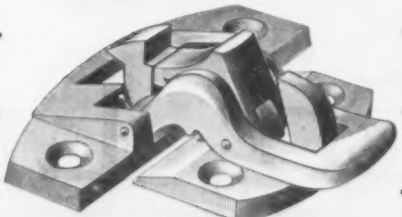
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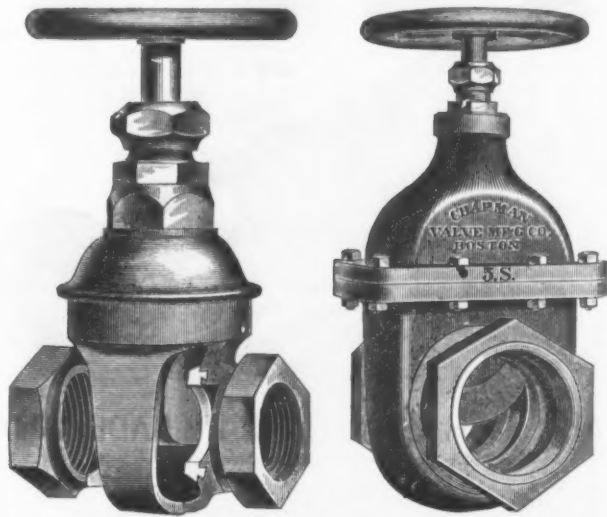
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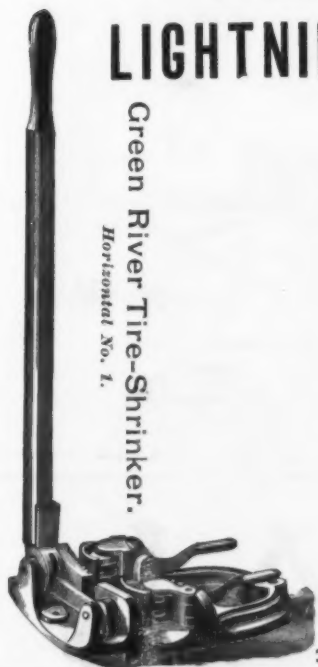
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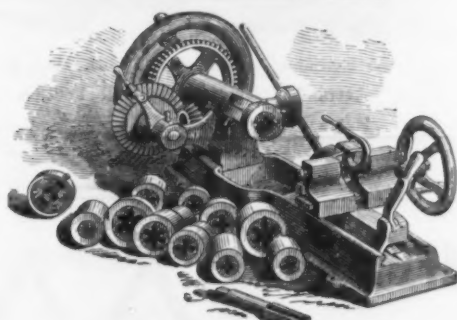
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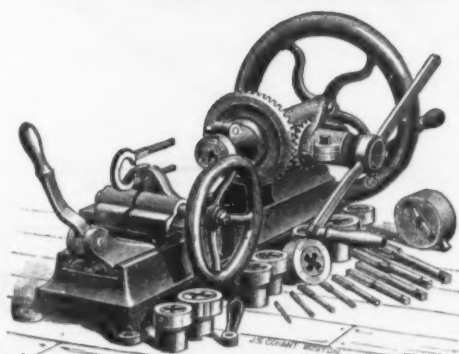


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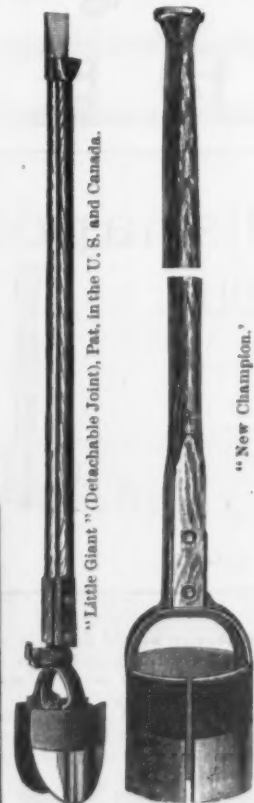
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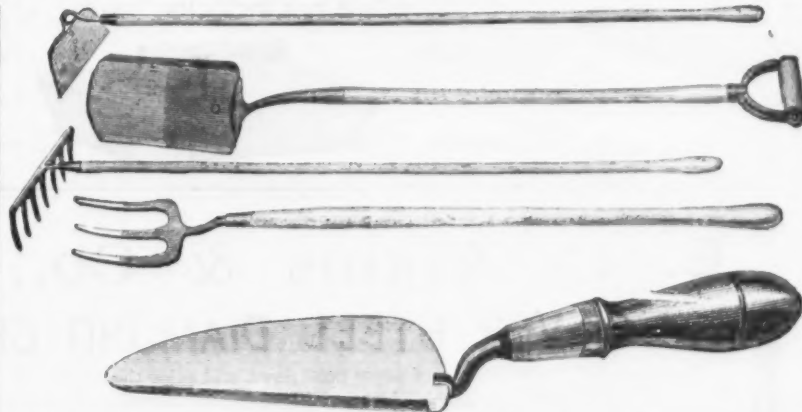
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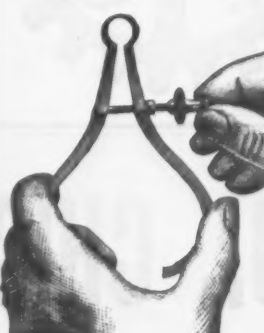
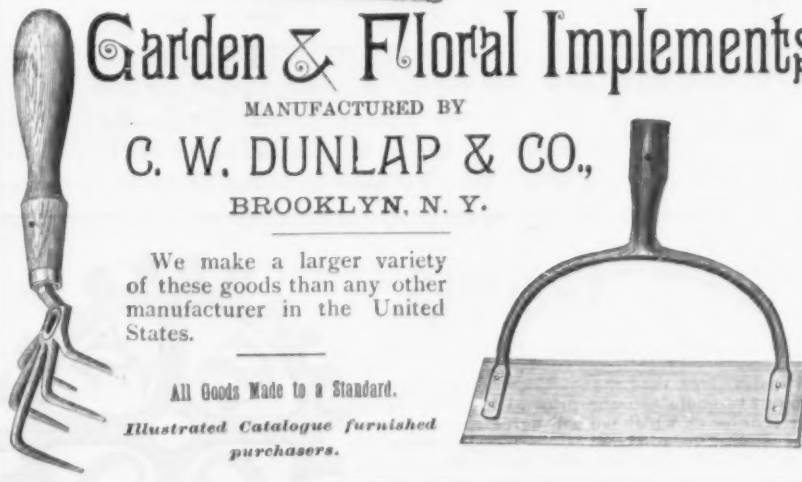
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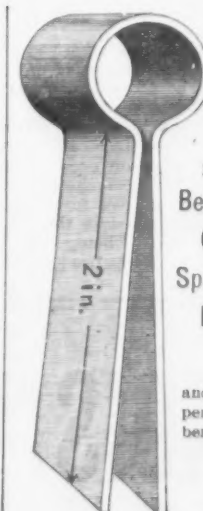


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1887.

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The trade will soon find an ordinary and roughly-made Reel of blades and stationary knife is not all that is required to make a perfect Lawn Mower.

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LIGHTEST RUNNING
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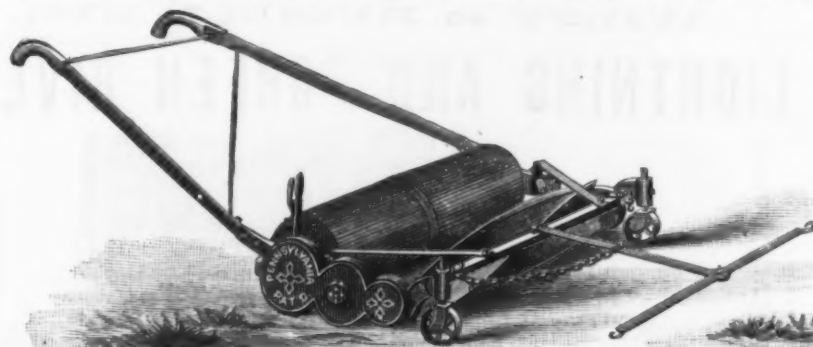
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Showing Mower with Seat and Spring, Shafts and Handles. Draft Irons Detached.
Width of cut 30 inches. Weight, 320 lbs.



Horse Mower, Open Cylinder, 30 inch Cut, with Handles and Draft Irons, - - - \$110.00
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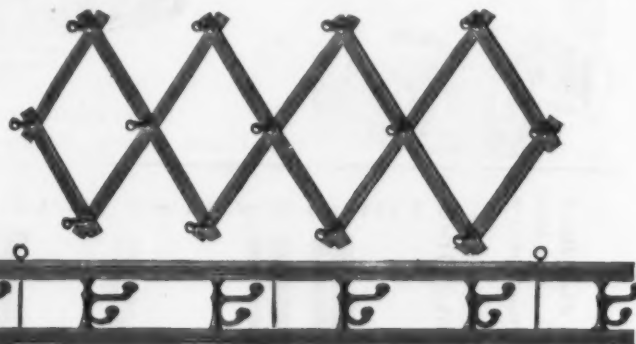
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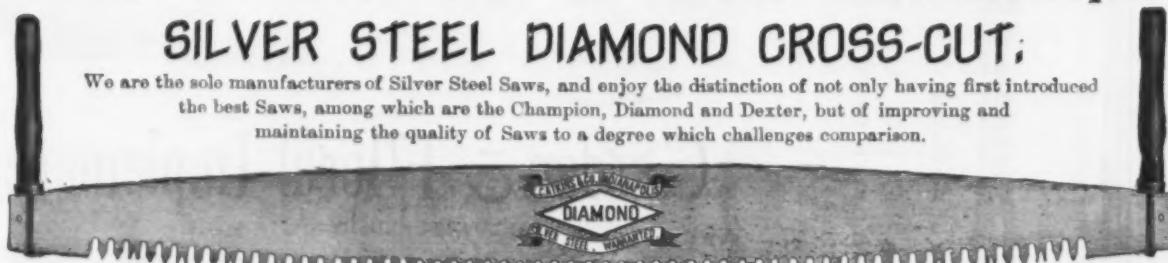
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THE WAINWRIGHT EXPANSION JOINT
prevents leakage of joints and fracture of connections.



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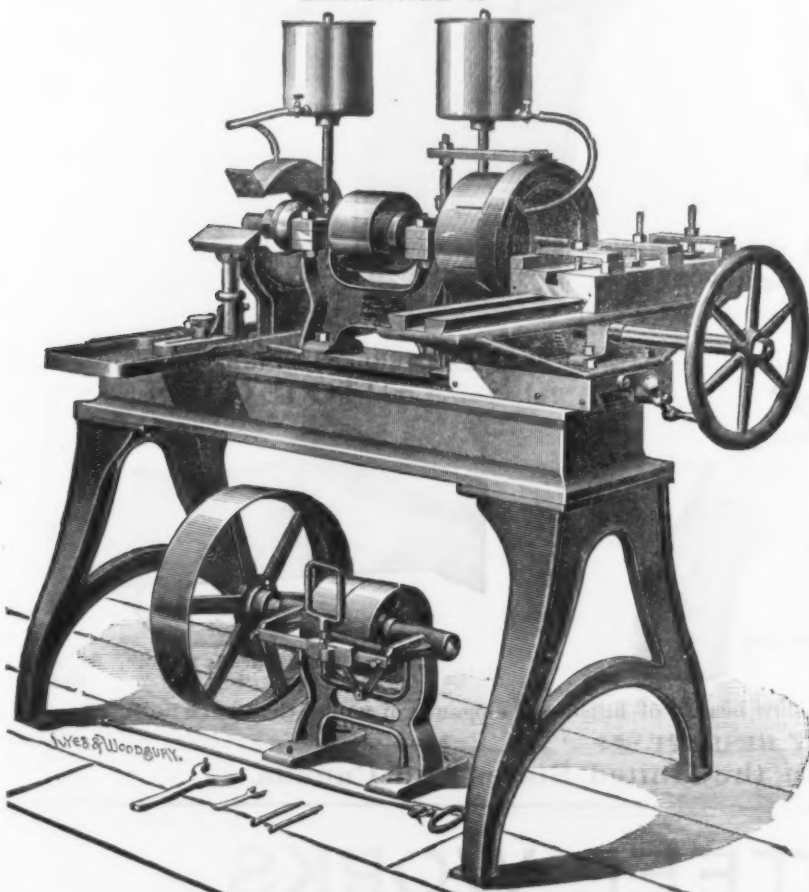
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The Wainwright Expansion Joint is constructed of corrugated copper seamless drawn tubing, which possesses great longitudinal flexibility, and absorbs the strain caused by the expansion and contraction. It is fitted at both ends with screw or flanged surfaces, for connection. These joints are positive, doing away with Stuffing Boxes and packing.



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EMERY WHEELS AND EMERY WHEEL MACHINERY
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WATER PREVENTS HEATING THE WORK.

Will ship on their merits for 30 day's trial.

55 Styles and Sizes of Emery Wheel Grinders, adapted or almost any class of work.

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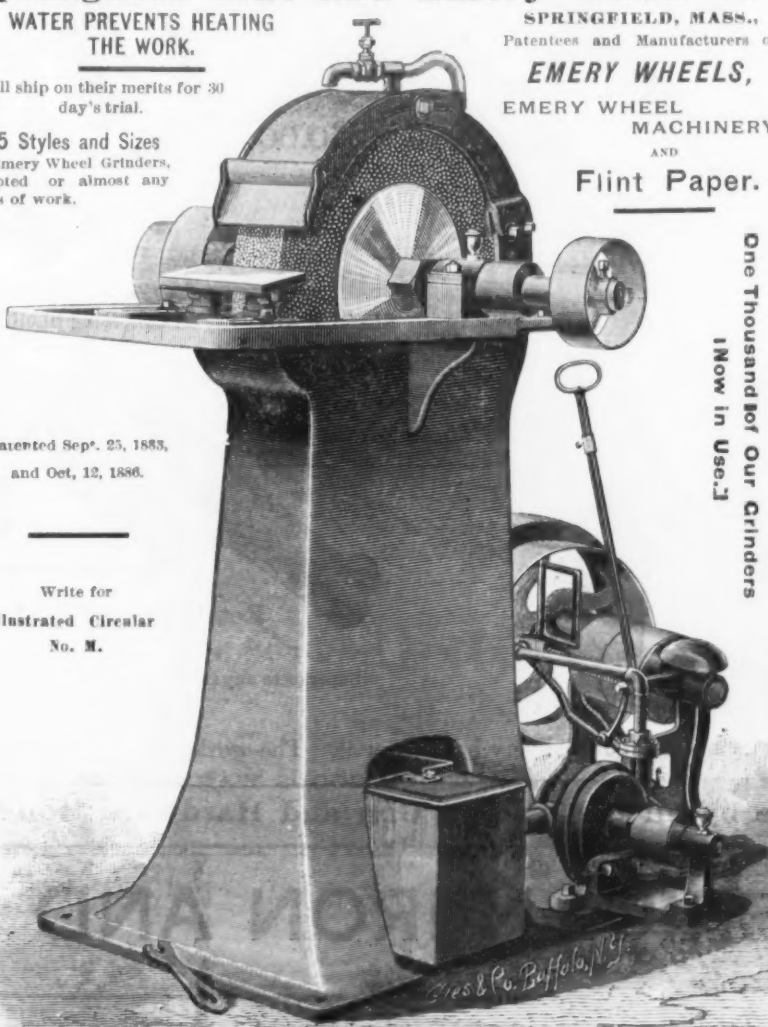
EMERY WHEEL MACHINERY

AND

Flint Paper.

Patented Sept. 25, 1883,
and Oct. 12, 1886.

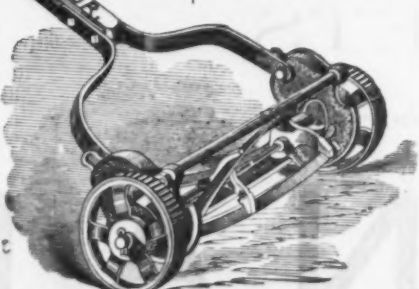
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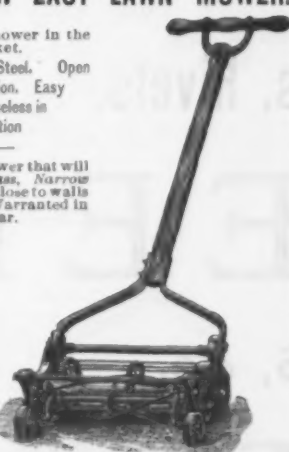


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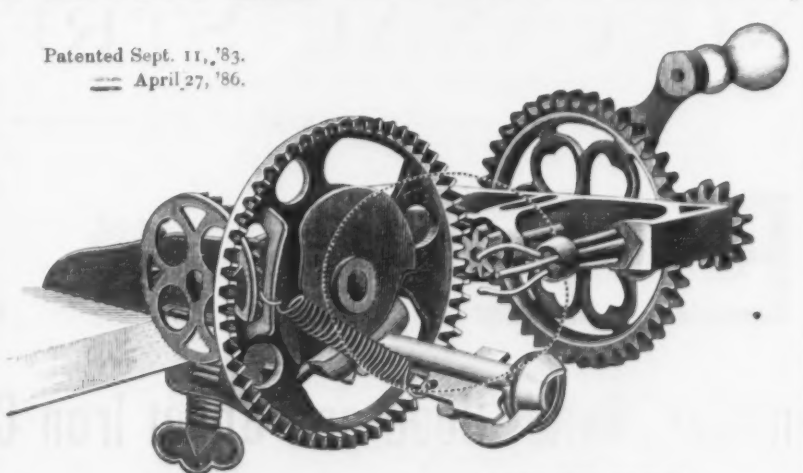
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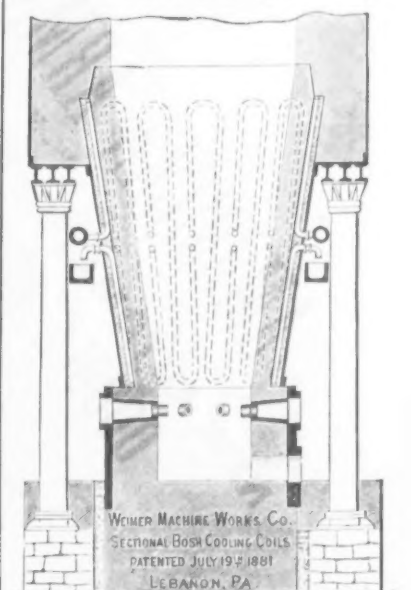
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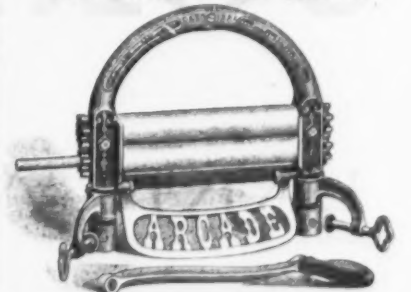
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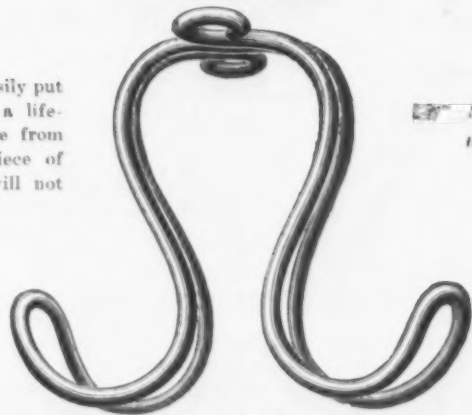
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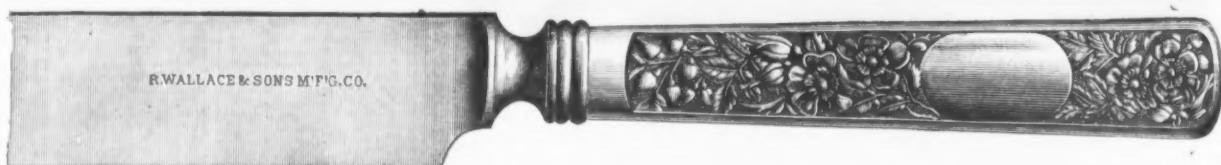
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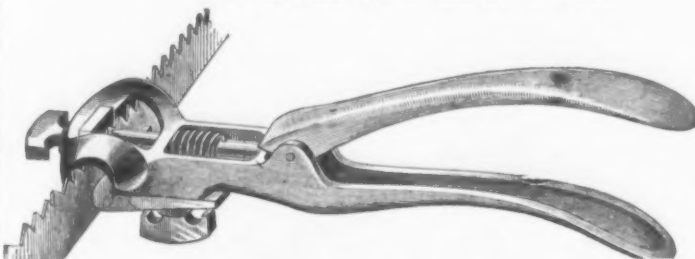
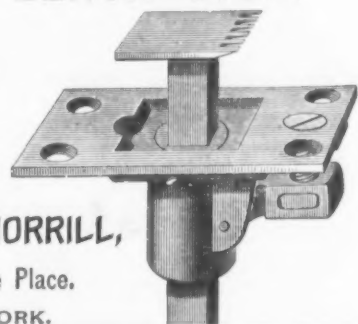
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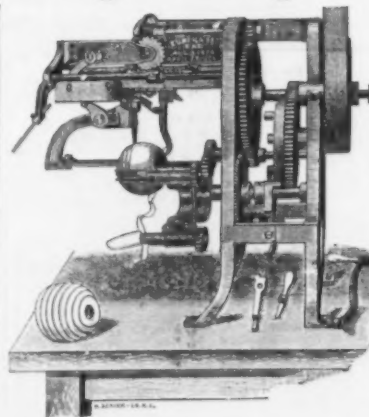
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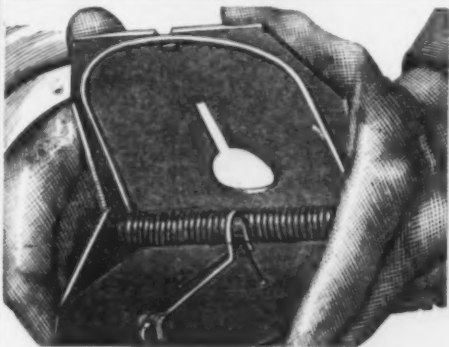
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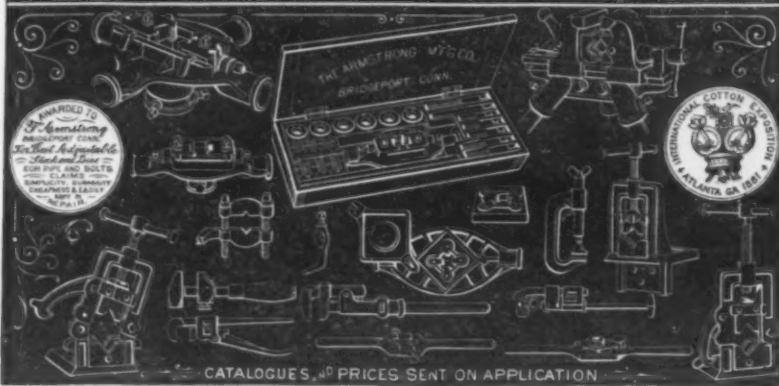
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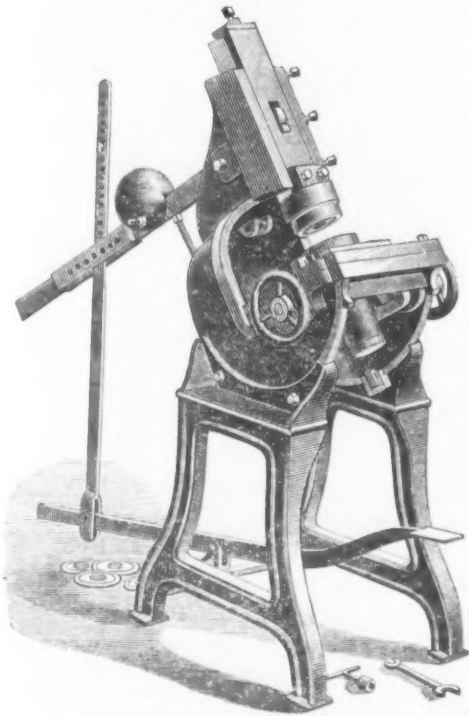


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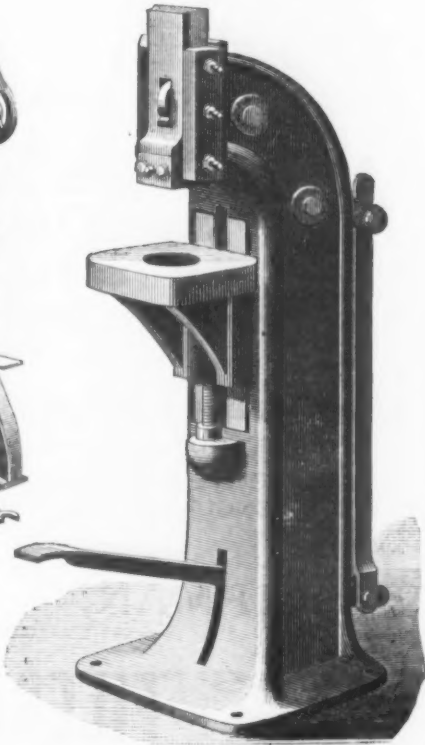
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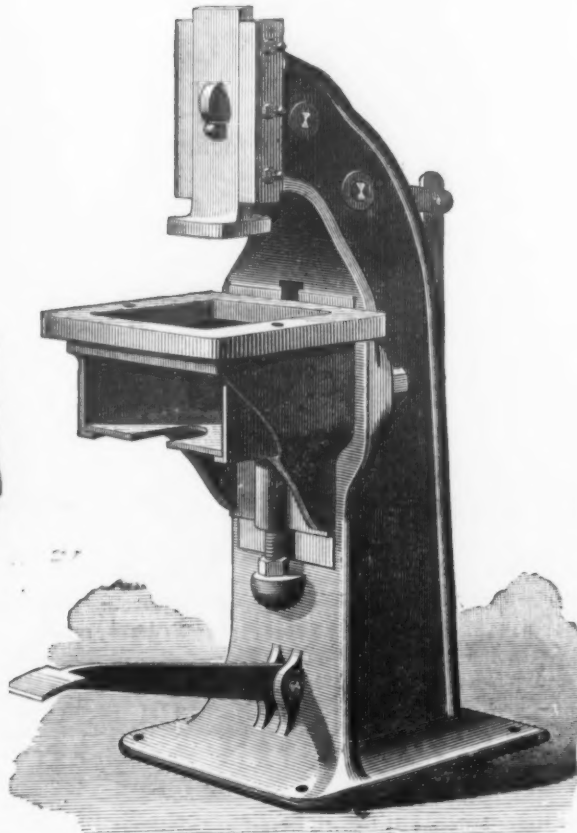
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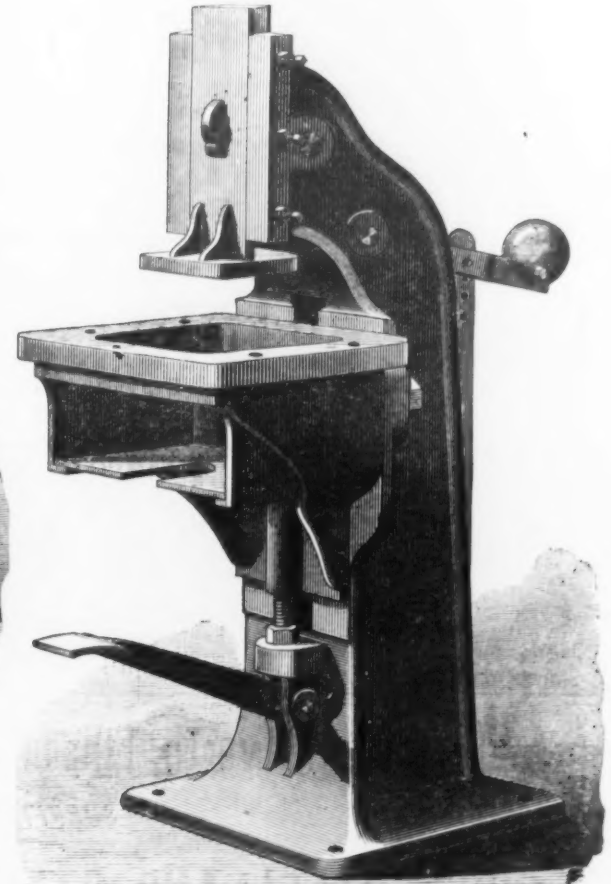
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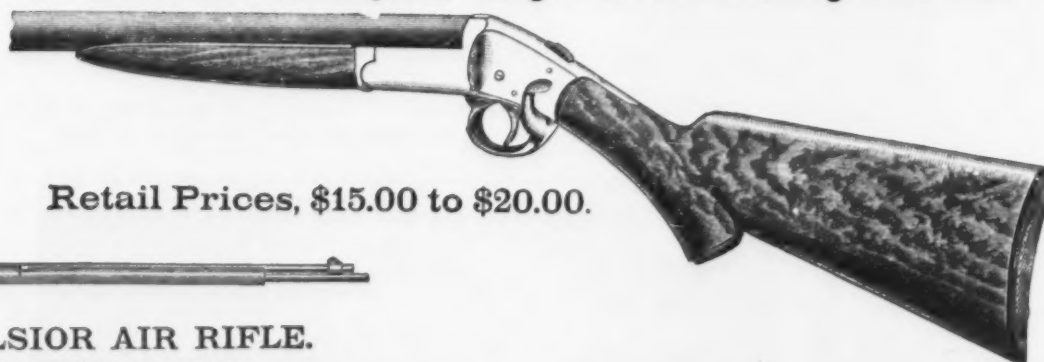


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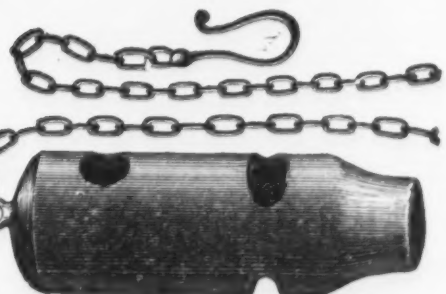
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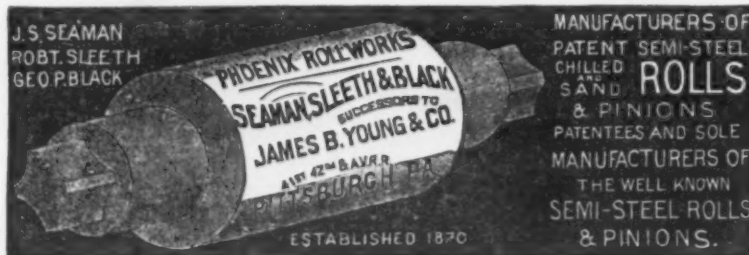
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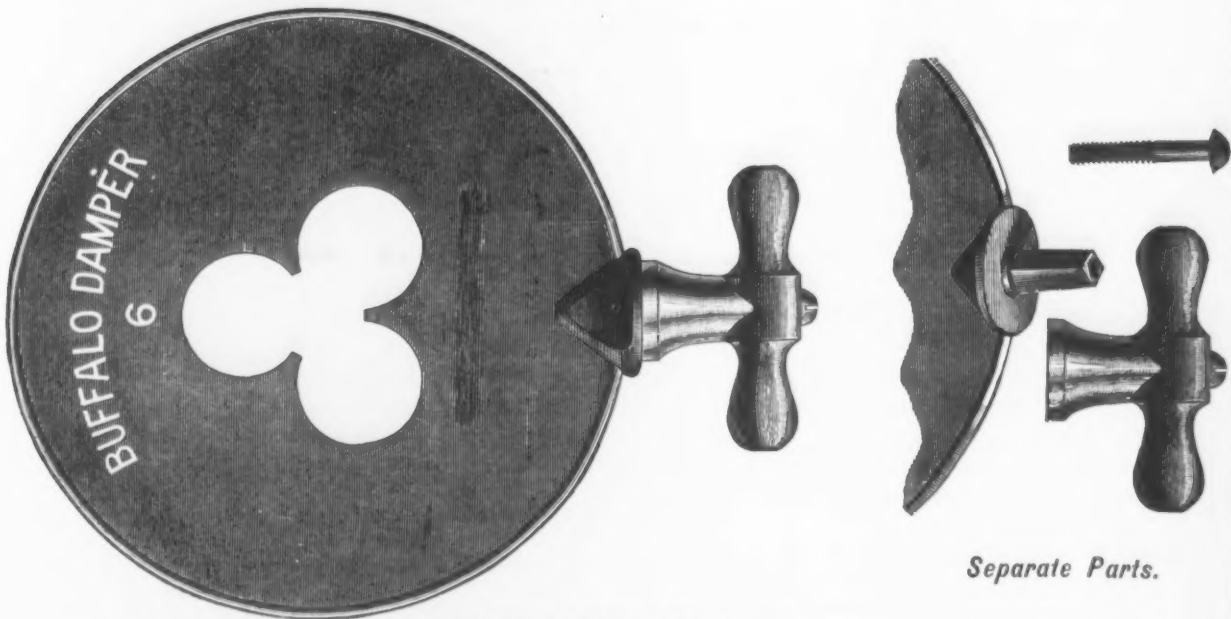


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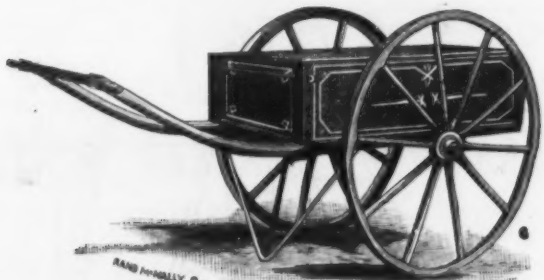
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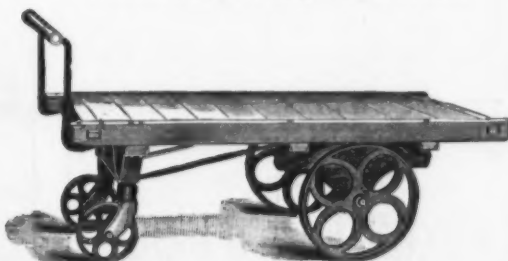
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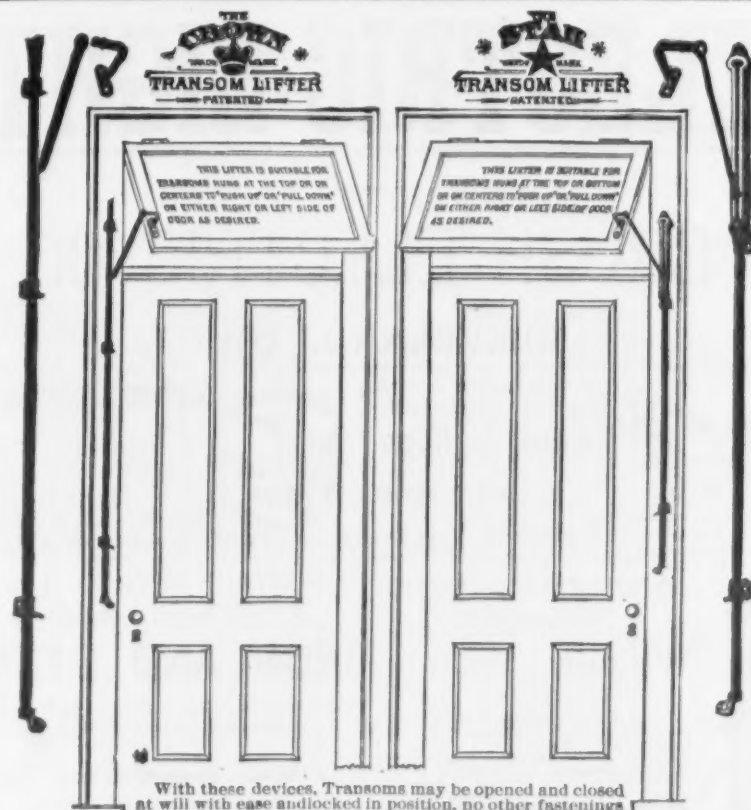
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44	4 "	" "	" "	0.65	84	4 "	" "	" "	0.80
45	5 "	" "	" "	0.75	85	5 "	" "	" "	0.90
46	6 "	" "	Nickel Plated.	1.75	86	6 "	" "	Nickel Plated.	2.00
47	7 "	" "	" "	2.00	87	7 "	" "	" "	2.25
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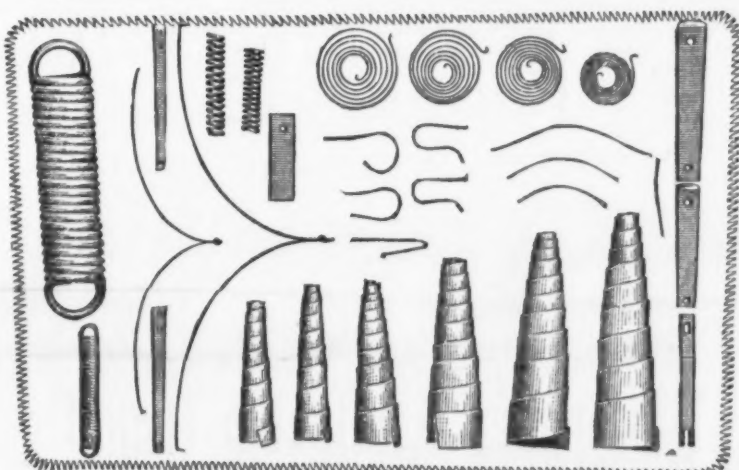
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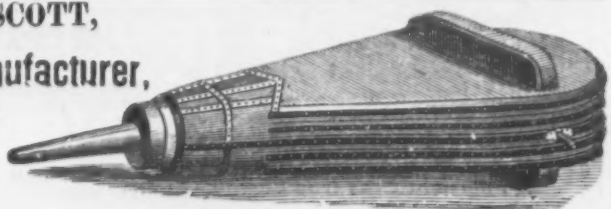
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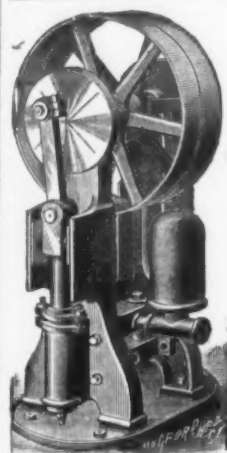
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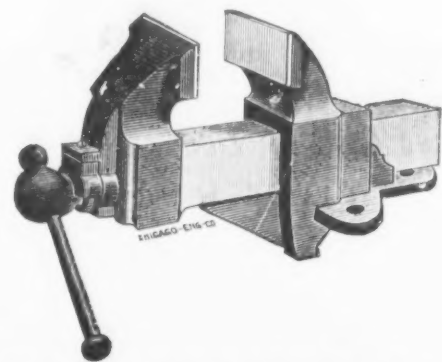
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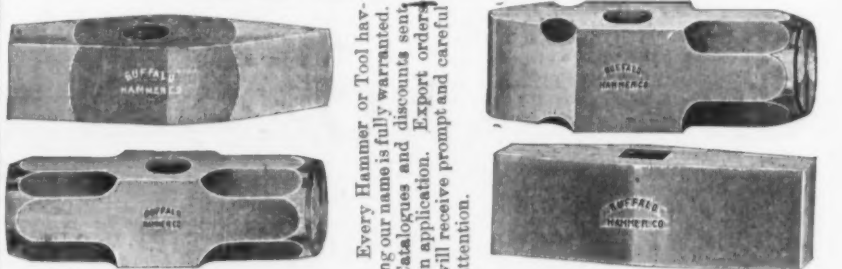
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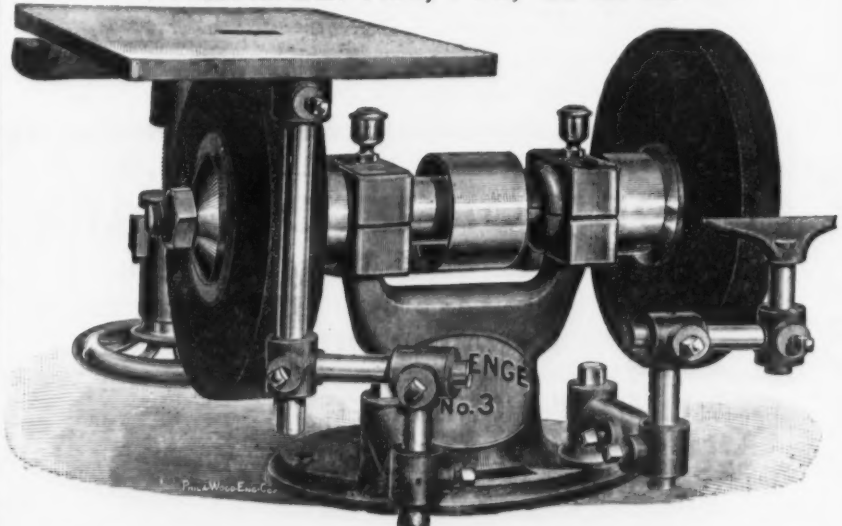
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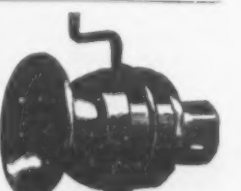
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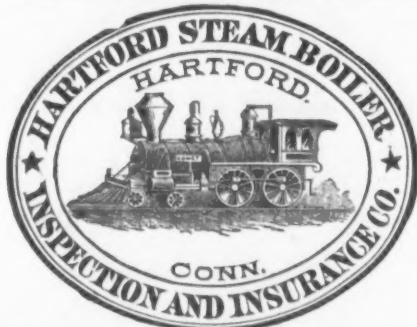
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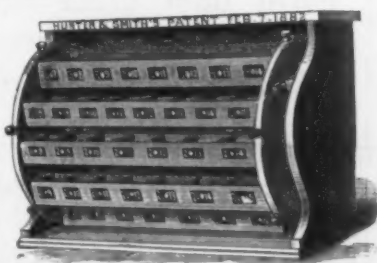
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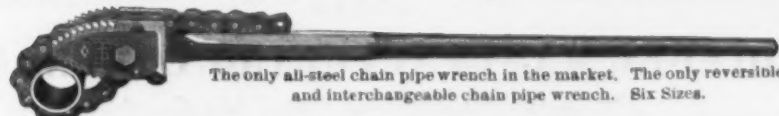
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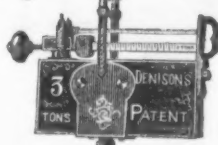
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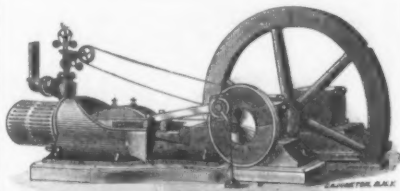


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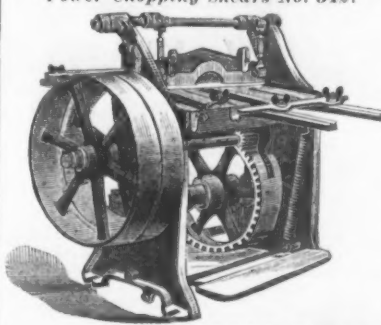
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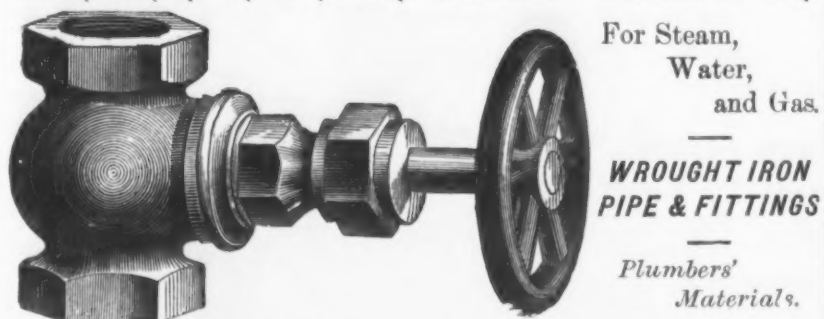
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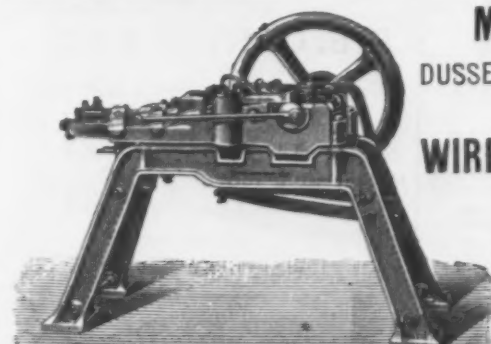
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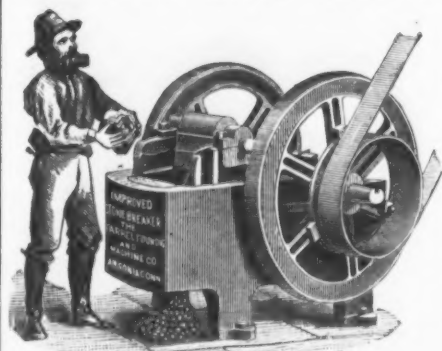
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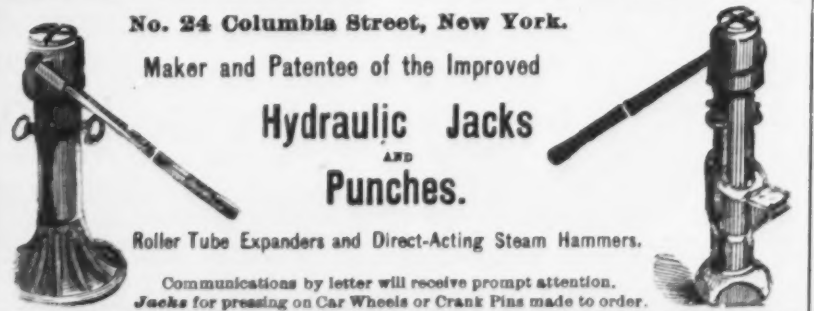
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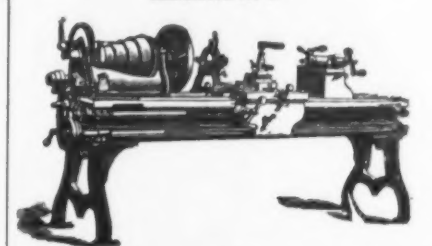
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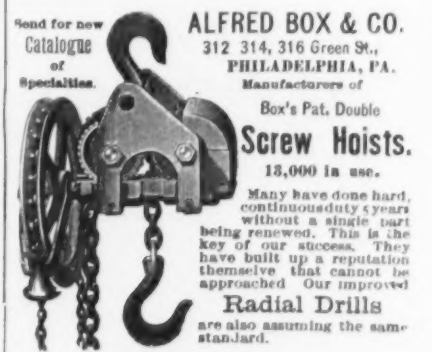
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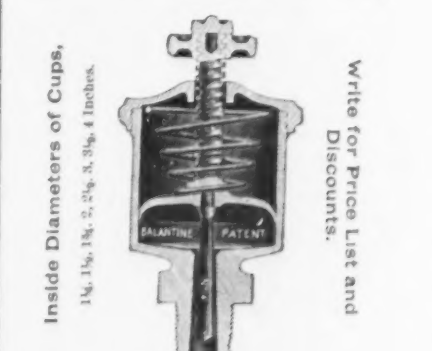
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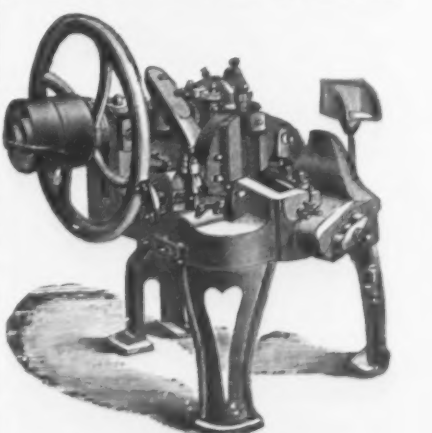
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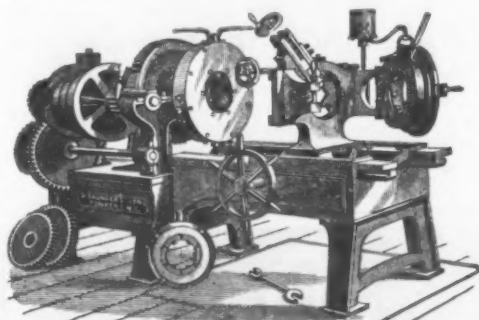
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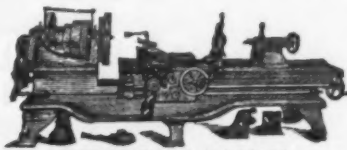
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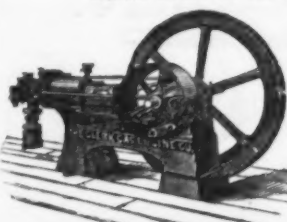
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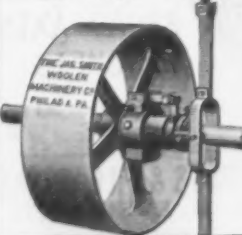


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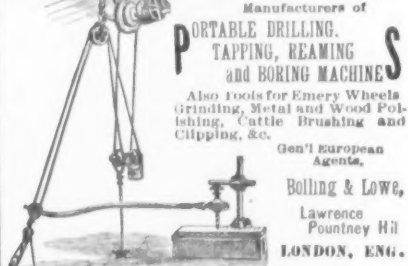
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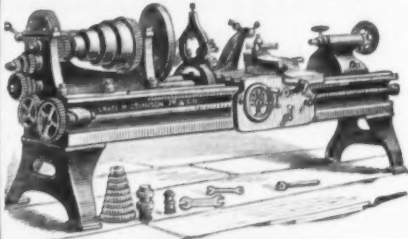
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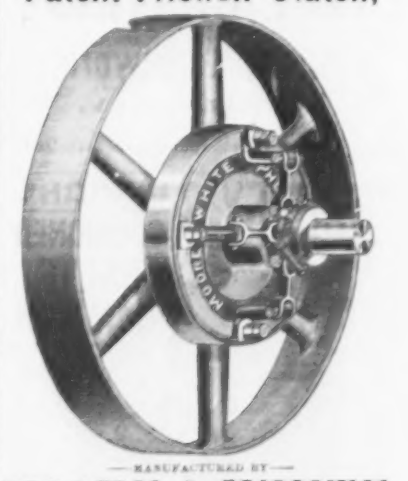
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Published by DAVID WILLIAMS, 66 and 68 Duane St., New York.
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Nos. 5, 7 and 9 Elm St., New York.